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(Clinicopathologic Conference)

FROM the University of Pennsylvania. A critical and practical analysis of a disease condition in a canine patient. Page 475

Animal Hospital Zoning Problems

AN AUTHORITATIVE discussion of a program for eliminating certain restrictions on animal hospitals. Page 437

Three Articles on Leptospirosis

EFFECTS on reproductive efficiency in cattle. Page 449

COMPARISON of an attenuated vaccine with bacterins. Page 452

PERSISTENCE of leptospires in swine tissues. Page 455

Vol. 139 August 15, 1961 No. 4

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Journal

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Vol. 139 No. 4 August 15, 1961

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Correspondence

Corporate Practice

July 7, 1961

Dear Sir:

I thought you might be interested in some developments subsequent to the completion of my article, "The Corporate Practice of Veterinary Medicine," which appeared in the July 15 issue of the JOURNAL. Florida has passed a "Professional Service Corporation Act" (H.B. 2161), which will become effective on September 1. The act is similar to the bill introduced in the Iowa legislature, which is discussed in a footnote of the article. It purportedly will allow any professional individual or group to form a professional service corporation. This should be of definite interest to Florida veterinarians.

A recent opinion of the Connecticut Attorney General expresses that a corporation cannot be formed for the purpose of practicing veterinary medicine. It appears that the determination was reached by the same reasoning process used by the Washington Attorney General. The Connecticut Attorney General went on to indicate that the prohibition also prevents the incorporation of veterinary hospitals and clinics. Medical group clinic corporations are distinguished due to express statutory authorization in Connecticut. This information may be found in the June 20, 1961, "Report Letter" of CCH Corporation Law Guide.

Sincerely,
s/DON A. JENSEN
Comments Editor, Iowa Law Review

Professional Attire

July 8, 1961

Dear Sir:

On page 38 of the July 1 issue of the JOURNAL, there is an American Cyanamid advertisement which depicts a veterinarian in decidedly sloppy attire. Most veterinarians would not think of appearing before their clients without a clean white gown or jacket or, in the case of large animal practitioners, clean coveralls. I thought everyone was interested in up-grading rather than down-grading the profession.

s/CAMERON W. ARGUE, D.V.M.
Bernardsville, N. J.

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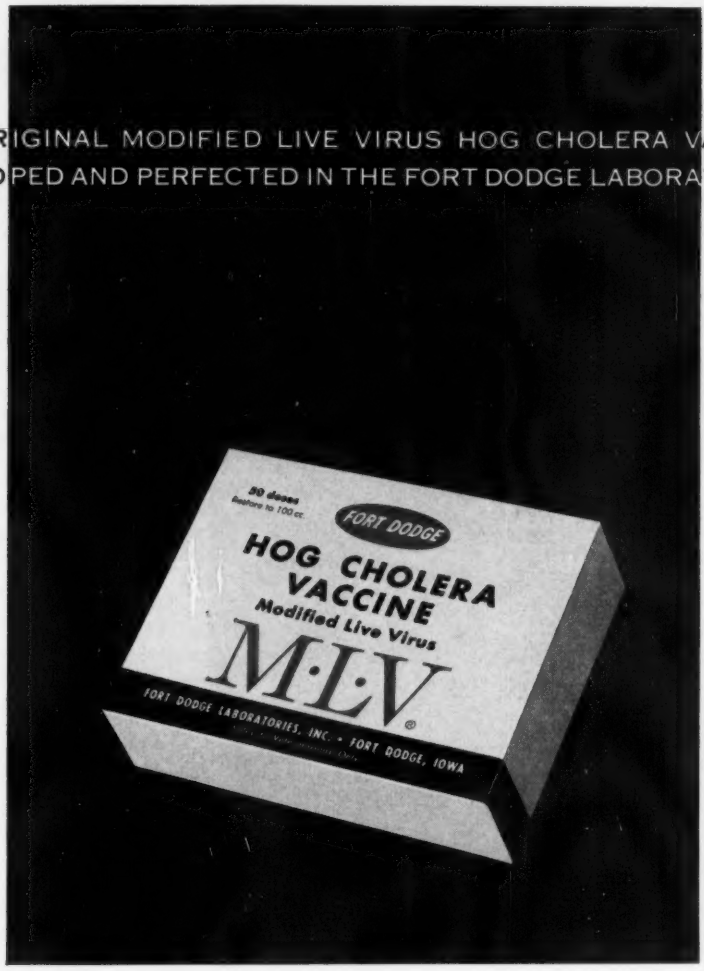

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Is It the AVMA RESEARCH Trust Fund?

As a matter of fact, research is only a by-product of the AVMA fund—nothing more. The money makes possible the training, mostly postgraduate, to prepare candidates for research; actually, it is not a research fund alone, but is a training fund as well.

The distinction between research and training is most important. Here is why. There is a great deal of money available from many sources for research. It would seem that the supply is almost limitless. The dominant prerequisite for receiving a grant of money is the availability of an adequately trained, competent, research scientist. Through him, other requirements such as a good research design and a feasible project are met rather easily. The grants are there to be given. The big problem for the granting agency is to learn in whom they can invest their money wisely.

Jack O. Knowles, Chairman
AVMA Executive Board

The AVMA's goal, then, is not to compete with Washington, the Fords, the Guggenheims, and the Rockefellers in giving away money. Rather, we want to make it easy for such people to invest in veterinary medicine. We want to give them what they need: a significant number of veterinarians who qualify, and with as much training as possible.

The potential is tremendous. As little as $3,000 or $4,000 from us will enable a recent graduate to obtain another year's training. Two or 3 years' training may qualify him for millions of dollars in grants. This is no dream. It happens. Two veterinarians to my knowledge have received over a million dollars each in grants recently.

There are other benefits. They are in another field but perhaps one even more useful than securing research money. One way or another, nearly all of our research fellows teach other veterinarians. Many of them actually enter the academic field while others teach as an adjunct to their work. For example: with the help of the AVMA Research Trust, Dr. W. G. Magrane took his postgraduate work in ophthalmology a few years ago. Since then, he has not only been more useful as a practitioner, but he has gone up and down the country, and even to Europe, giving courses — sharing his knowledge with his colleagues. How would you estimate the return to veterinary medicine from our little help toward his specialization? How many similar opportunities have we missed?

Several members of the Executive Board have indicated that a more descriptive title for the AVMA Research Trust Fund would help to clarify its purpose, and this may be considered soon.

Our future will so closely parallel our competence that training must be regarded as one of the first responsibilities of the AVMA. If changing a title or any other action by the Board would help to attract adequate support, it would be worth the trouble many times over.

Jack O. Knowles

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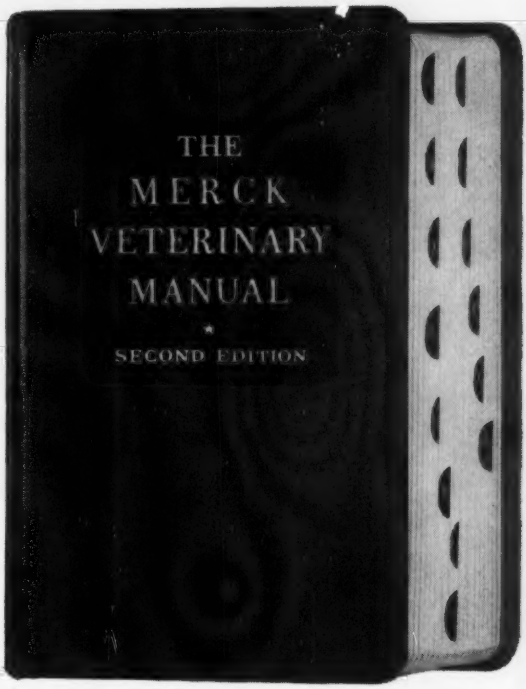

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news from Washington . . .

FROM THE AVMA WASHINGTON OFFICE
J. A. McCallam, VMD
Brig. Gen. USA (Ret.)

LEGISLATION

Social Security Amendments

H.R. 6027—Amendments to Title II of the Social Security Act became *Public Law 87-64* when signed by the President, June 30, 1961 (see JOURNAL Aug. 1, 1961, p. 300).

Milk Program for Children

S. 146—Extending and increasing the special milk program for children, became *Public Law 87-67* on June 30, 1961; authorization not to exceed $105 million.

Mutual Educational and Cultural Exchange Act

S. 1154—Mutual Educational and Cultural Exchange Act of 1961, with amendments, was passed by the Senate, July 14, 1961, by a vote of 79 to 5.

Water Pollution Control

H.R. 6441—To amend the Federal Water Pollution Control Act for more effective control of water pollution. The conference report on the bill was adopted by the Senate and cleared for the President.

Duty-Free Allowance Reduction

H.R. 6611—Reduction of the duty-free allowance permitted returning travelers, was passed by the Senate with committee amendments, and cleared for House action (see JOURNAL Aug. 1, 1961, p. 300).

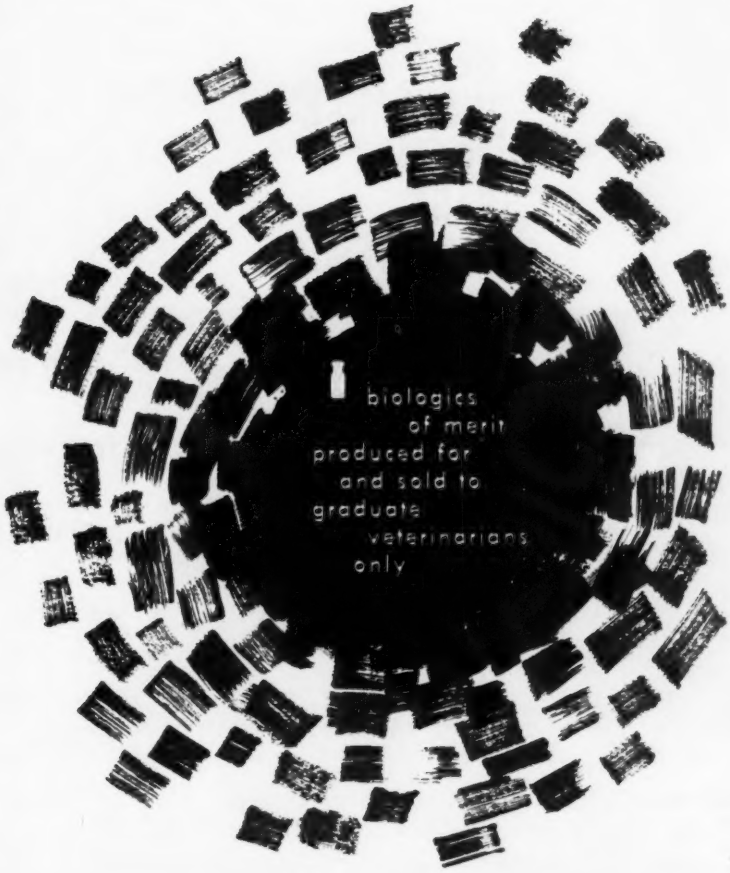
COMMITTEE REPORTS AND HEARINGS

National Defense Education Act

House Committee on Education and Labor—Reported favorably a "clean bill" amending the National Defense Education Act of 1961 (in lieu of *H.R. 6774*, the administration measure). House Report No. 674 contains majority and minority views, and Report 674, Part 2, contains additional views of five minority members. Among the ten titles are those pertaining to loans to students in institutions of higher education, loans to educational institutions, and fellowships. Both reports may be obtained free by writing: House Document Room, U.S. Capitol Building, Washington 25, D.C.

Armed Forces Reserve Programs

Senate Armed Services Committee—Reported favorably *H.R. 5490* with amendment, providing for more effective participation in Reserve components of Armed Forces, and pertaining to amendments of the six-month training program. Purpose of the bill is to close some statutory gaps in Reserve Forces Act of 1955, including: Reduction of the obligated service from 8 to 6 years for those enlisting in the 6-month program prior to age 18½; statutory deferment for those who enlist in the program after age 18½ (deferment is now by regulation only); authority for priority induction of those who enlist in program after age 18½ and fail to participate satisfactorily; flexibility in terms of enlistment in the National Guard; and modification of the 6-month requirements in the case of ROTC graduates.



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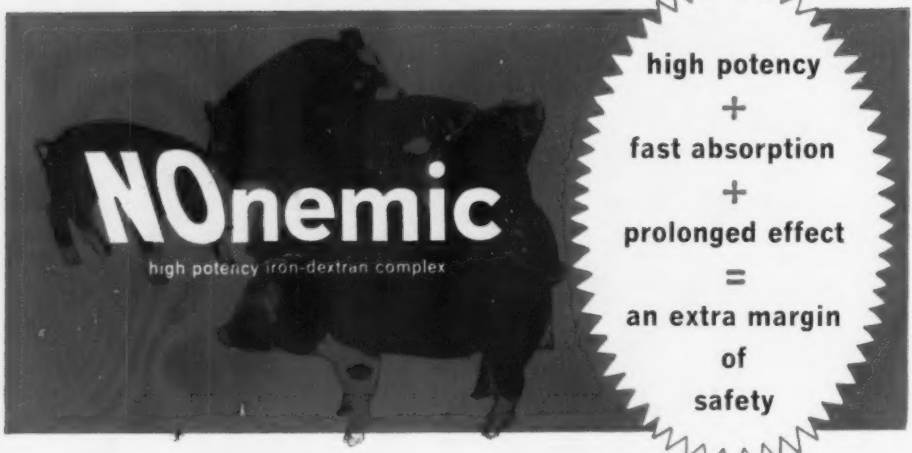

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*Dawson, H.A.; Lockfeldt, W.E., and Brengle, L.A.: J. Am. Vet. Med. Assoc. *135*:69 (July 1) 1959.

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Two New Executive Board Members Elected

Dr. Richard D. Turk, of Bryan, Texas, and Dr. Robert J. Schroeder, of Downey, Calif., have been elected to serve on the AVMA Executive Board for Districts VIII and X, respectively.

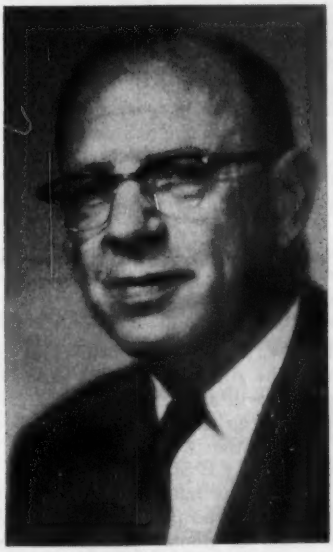
The Executive Board, the "board of directors" of the Association, is made up of 12 members, representing the 12 AVMA Executive Board Districts, and the president, president-elect, and immediate past-president of the Association. Board members are elected by mail ballots cast by AVMA members within the district where a vacancy has occurred.

Dr. Richard D. Turk (KSU '33) will represent AVMA Executive Board District VIII, which is made up of Arkansas, Louisiana, and Texas.

Dr. Turk is professor and head of the Department of Veterinary Parasitology, School of Veterinary Medicine, A. & M. College of Texas, a position he has held since 1944. In addition to teaching veterinary parasitology at the College, he conducts research and is research coordinator for the Texas Agricultural Experiment Station. He is chairman of the annual veterinary conference and of the veterinary library committee at the College.

For a year immediately after he received his D.V.M. degree, Dr. Turk was a private practitioner. From 1934 to 1936 he worked with the USDA, Bureau of Animal Industry. He worked at the Texas Agricultural Experiment Station from 1936 to 1944 and received his M.S. degree in 1939 from the A. & M. College of Texas. He was a veterinary consultant at the Walter Reed Memorial Research Center from 1953 to 1958.

Dr. Turk has served many organizations in official positions. He has been a member of the AVMA Council on Research for many years; his present term will expire in 1963. He was president of the Texas V.M.A. in 1958, a member of the Executive Committee of the Conference on Research Workers in Animal Disease in North America from 1954 to 1958, president of the same group in 1959, on the Committee on Animal Health of the National Research Council from 1954 to 1962, and president of the Animal Disease Research Workers in Southern States from 1959 to 1960. He is a member of the U.S. Livestock Sanitary Association and the American Society of Tropical Medicine and Hygiene.



Dr. Richard D. Turk

Dr. Turk received high honors when he was awarded his D.V.M. degree at Kansas State University in 1933. He received the Faculty Award of the *Southwestern Veterinarian* in 1956 and a Distinguished Service Award from Kansas State University in 1960.

He is the author or co-author of 40 sci-

entific papers and a contributor to two books, *Canine Medicine*, and *Cattle Diseases*.

Executive Board District X will be served by Dr. Robert J. Schroeder (COL '47). This district includes Arizona, California, Hawaii, and Nevada.

Dr. Robert J. Schroeder

Immediately after he received his D.V.M. degree, Dr. Schroeder participated in the foot-and-mouth disease control program in Mexico.

In 1948 he joined the Los Angeles County Livestock Department. He was promoted to senior veterinarian in 1952 and in 1957 was appointed department head by the Los Angeles County Board of Supervisors.

Dr. Schroeder has also had many organizational affiliations. In 1960 he was secretary of the AVMA Section on Regulatory Veterinary Medicine. He is a member of the Ways and Means Committee of the California V.M.A. and is the immediate past-president of the Southern California V.M.A. He is chairman of the Public Health Committee of the U.S. Livestock Sanitary Association; chairman of the Food and Agriculture Committee of the Los Angeles Chapter, United Nations Association; advisor to the Board of Directors, Los Angeles County Farm Bureau; and member of the Agriculture Committee, Los Angeles Chamber of Commerce. He also holds memberships in the Southern California Woolgrowers Association and in the California Dairy Industries Association.

The two new Executive Board members will meet with the Board for the first time Aug. 24, 1961, during the AVMA convention in Detroit. The terms of both Drs. Turk and Schroeder will expire in 1967.

Dr. L. W. Morrey to Address AVMA Writer's Conference

Dr. Lon W. Morrey, editor-in-chief of the *Journal of the American Dental Association*, Chicago, Ill., will speak at the AVMA Writer's Conference, Aug. 21, 1961, in Detroit, Mich., during the AVMA convention. His topic will be "Say It Simply."

Dr. Morrey has had a long and distinguished career in the profession, particularly in the fields of dental journalism, dental health education, and dentistry for children.

Before becoming editor of the *Journal of the American Dental Association* in 1947, he served as director of the Bureau of Public Relations of the association for 14 years.

During his career, Dr. Morrey also has been dental director for the state of Illinois and director of the Division of Dental Hygiene of the Chicago Board of Health.

In recognition of his contributions to dental journalism, he was presented the C. N. Johnson memorial award in 1958 by Loyola University School of Dentistry and the Odontographic Society of Chicago award in 1959. The University of Indiana conferred on Dr. Morrey an honorary degree of Doctor of Laws in April, 1959.

He is a member of the Board of Directors of the National Society for Medical Research and the Tuberculosis Institute of Chicago and Cook County and is representative of the American Dental Association to the Animal Care Panel.

He is a life member of the American Dental Association, Illinois State Dental Society and the Chicago Dental Society and an honorary member of the North Carolina Dental Society. He also is a member of Federation

Dr. Lon W. Morrey

Dentaire Internationale and a fellow of the American College of Dentists. He belongs to the honor society Omicron Kappa Upsilon, Psi Omega, and a number of other national dental and allied health organizations.

Dr. Morrey was graduated in 1923 from Loyola University School of Dentistry, Chicago College of Dental Surgery.

Dr. Morris' Comments Now Available

At the Public Relations Round Table in May, Dr. Mark L. Morris, AVMA president-elect, described AVMA activities and goals.

The participants at the Round Table were so impressed by his comments that they requested tape-recordings be made of them for distribution to veterinary medical associations.

The recordings have been produced and are available to veterinary medical associations upon request from the Department of Public Information, AVMA, 600 S. Michigan Ave., Chicago 5, Ill.

Veterinary Career Pamphlet Available Free

The pamphlet "Should You Be a Veterinarian?" is now available on request from the American Veterinary Medical Association, 600 S. Michigan Ave., Chicago 5, Ill., or the New York Life Insurance Company, Career Information Service, Box 51, Madison Square Station, New York 10, N.Y.

The booklet is one of 47 career booklets prepared by the New York Life Insurance Company to "help guide young people to a better future." The text of the booklet was prepared by Dr. I. A. Merchant (COL '24), dean of the College of Veterinary Medicine, Iowa State University.

It was originally prepared in the form of an educational advertisement entitled "Should Your Child be a Veterinarian?" The advertisement appeared in the July 8, 1961, issue of the *Saturday Evening Post* and in the June 20, 1961, issue of *Look*. Later, the same material that appeared in the advertisements was put into pamphlet form.

Grants for Study in Russia Available

The Inter-University Committee on Travel Grants, representing American colleges and universities, is soliciting inquiries and applications from graduate students and scholars who wish to spend all or part of the academic year 1962-1963 engaged in study and research in the Soviet Union as participants in the academic exchange between the United States and the U.S.S.R.

American citizens under 40 years of age are eligible if they are graduate students, post-doctoral research workers, or faculty members at the time of application. Teachers of the Russian language in secondary schools are also eligible.

Opportunities for study in any field, including veterinary medicine, exist if the individual applicant can indicate to the scientists and scholars on the screening committee that there is professional and scientific benefit to be derived from his study and research in the Soviet Union. There is no limitation by fields or quota of numbers within fields.

A knowledge of Russian adequate to the needs of study and research is required. Other criteria for selection include intellectual ability, maturity, emotional stability, proven scholarly competence or indication of future professional promise, and substantial knowledge of both American and Russian history and culture.

Periods of study and research between

one semester and 15 months can be arranged. Persons wishing to spend a minimum of one academic year in the Soviet Union may be accompanied by their wives. Limitations imposed by the Soviet side prevent exchange participants' taking other members of their families with them.

Funds are available to cover all or part of the exchange participant's expenses, including maintenance of family, depending on the participant's own financial needs and resources.

Since the program began in September, 1958, 66 American graduate students and young faculty members have spent from 5 months to 2 academic years in the Soviet Union. Thirty-eight additional Americans will spend all or part of the year 1961-1962 there. An approximately equal number of Soviet students have spent up to a year in the United States since 1958.

For further information and applications, write to: Stephen Viederman, Deputy Chairman, Inter-University Committee on Travel Grants, 719 Ballantine Hall, Indiana University, Bloomington, Ind.

Applications must be received no later than Dec. 15, 1961, to be considered for the 1962-1963 exchange.

Dr. A. M. Mills (left) is told of the establishment of the "A. M. Mills' Award" by Dr. T. J. Jones.

A. M. Mills' Award Established at Georgia

At the School of Veterinary Medicine, University of Georgia, the "A. M. Mills' Award" for outstanding contributions to veterinary medicine has been established and will be presented annually by the Lambda Chapter of Alpha Psi Fraternity.

Dr. Adrian M. Mills (COR '20), retiring professor of veterinary medicine and head of the Department of Clinics and Medicine at the school, was honored by the fraternity at a banquet May 17. The establishment of the award in his honor was announced at that time.

In addition to his position on the faculty of the school, Dr. Mills is secretary of the Georgia V.M.A., editor of the *Georgia Veterinarian*, and vice-president of the National Council of Alpha Psi.

A committee composed of 9 faculty members representing various departments of the School of Veterinary Medicine will make the selection of award winners. The first "A. M. Mills' Award" will be presented in 1962. Recipients will be selected from veterinarians across the country and must possess the qualities that have endeared Dr. Mills to those who have known him.

"The advice that is given so freely and with such warm humility to everyone, be it a practicing veterinarian, farmer, or student, with personal problems has been his hallmark," said the University in announcing the establishment of the award.

Brucellosis-Free "Validated" Swine and Alternate Cattle Testing Program Proposed

At a special meeting called by the National Brucellosis Committee June 23, 1961, at AVMA headquarters in Chicago, it was the consensus of the 16 representatives assembled that they propose the following resolutions:

1. Approve and recommend the use of the term "validated" in connection with swine herds declared brucellosis-free under the uniform methods and rules set up by USLSA, and recommend that swine from these brucellosis-free herds be accepted by all states without further test.

Further, endorsement was given to the projected USDA swine brucellosis information program.

2. When 5% of all cattle 30 months of age and over in all herds in a control area have been screened annually for 3 years, and level of infection is found to be below minimum official levels, and an official vaccination program of an intensive level has been carried out concurrently, such procedures should be acceptable for official initial certification, provided approved back tagging and market testing procedures are employed.

The main purpose of introducing the alternative method of brucellosis certification was to counter the objection to recertification inconvenience voiced by cattle raisers in range states.

With the decline in bovine brucellosis, *Brucella suis* has become a more important cause of human brucellosis. About 1,000 cases of the porcine type occur in man every year and this incidence has remained constant for the last few years. It is hoped that an accelerated information program and a new program certification name ("validated") will influence swine raisers to participate more actively in a swine brucellosis eradication program.

Both resolutions have yet to be approved by the U.S. Livestock Sanitary Association and the USDA.

North Dakota V.M.A. Favors Mail Ballot

At the annual meeting of the North Dakota V.M.A., Dr. D. D. Clark (KSU '45), delegate to the AVMA House of Delegates, was instructed to vote for the mail-ballot method of electing AVMA presidents, to favor remuneration of AVMA presidents, and to oppose any plan to make membership in AVMA contingent upon concurrent membership in a constituent association.

Dr. D. F. Eveleth (ISU '34), Fargo, was elected president, and Dr. J. D. Vagneur (COL '41), Jamestown, vice-president. Dr. C. B. Bjornson (OSU '45), Fargo, who was hospitalized because of a heart attack 4 days before the meeting, was re-elected secretary-treasurer; Dr. I. A. Schipper (MIN '51) was elected assistant secretary-treasurer.

The association passed a resolution favoring national legislation for eradication of hog cholera. In accordance with the AVMA recommendation that constituent associations should be incorporated, North Dakota V.M.A. members adopted a revised set of bylaws and approved the incorporation of their association.

One of 5 out-of-state speakers, Dr. E. J. Frick (COR '18), Kansas State University, warned veterinarians to plan ahead economically. "The future is important," he said, "for that's where you're going to live."

Dr. D. A. Price (OSU '50), AVMA editor-in-chief, discussed association activities and plans. Commenting on the JOURNAL, he pointed out that although the majority of the readers are practitioners who prefer practice-oriented articles, only about 15% of JOURNAL articles are submitted by practitioners. He announced plans to publish a series of clinico-pathologic conferences and predicted that this new JOURNAL feature would be most popular.

Dr. Raymond Zemjanis (STK '48), University of Minnesota, spoke on bovine sterility. He emphasized that pregnancy testing 8 weeks after breeding makes it possible for the practitioner to obtain the best results for cattle owners.

Dr. Lyle Boley (KSU '49), Kewanee, Ill., gave an illustrated talk on the use of bovine dental crowns. In response to a question regarding durability of the crowns, he asserted that laboratory tests indicate durability to be approximately 16½ years; that in actual use, they should last for 6 or more years.

Veterinarian Honored for Civic Activities

Dr. S. I. Tschantz (OSU '52), a New Philadelphia, Ohio, general practitioner, recently won the annual Tuscarawas County Chamber of Commerce President's Award for outstanding community service in 1960-61. He was also awarded the Honorary Future Farmer Degree at the annual parent-son banquet of the organization.

Dr. Tschantz has a 20-year record of service to farmers of Harrison, Tuscarawas, and Wayne counties as a vocational agriculture teacher, and as a Farm Federation of America and 4-H advisor. He has been a Grange lecturer, Farm Bureau Advisory Council leader, and secretary-treasurer of the Cooperative Milk Producers Association.

Dr. E. J. Frick Honored at KSU

Dr. Edwin J. Frick (COR '18), Kansas State University, School of Veterinary Medicine, was honored by former classmates and

Dr. Edwin J. Frick accepts the photograph of himself and a plaque presented to him recently by his former classmates and students.

students at the 23rd Kansas State Conference for Veterinarians, June 12, 1961.

Dr. Frick, head of the Department of Surgery and Medicine for the past 26 years, relinquished his administrative duties July 1. However, he will continue as a member of the veterinary faculty until he reaches retirement age in 5 years. He has been on the Kansas State University faculty since 1919.

A program was produced in his honor and a color photograph of himself and a plaque were presented to him.

Southeastern Wisconsin V.M.A. Meets with Feed Dealers

A meeting to discuss mutual problems was held June 22, 1961, by the Southeastern Wisconsin V.M.A. and the feed dealers of the area.

During a panel-type program, 3 feed dealers represented their group while Drs. A. C. Kelman (KSU '45), Roy Nichols (ONT '33), and Miles Agee (KSU '50) represented the veterinary profession.

It is hoped that the discussions will help pave the way to better understanding between the 2 groups.

Auburn Receives Grant for Neurology Study

Auburn University has received a grant of $8,572 for the study of cranial neurology in the dog from the Mark L. Morris Animal Foundation. The study will be directed by Dr. B. F. Hoerlein (COR '43), head of the Small Animal Surgery and Medicine Department of the university.

The grant will support a postgraduate neurologic fellowship for one year. The study will include the physical diagnosis of neural lesions, cranial radiologic methods, and the establishment of brain surgical techniques in the dog.

New Public Health Award Established

Establishment of the annual Bronfman Prizes for Public Health Achievement, a new series of major awards to honor "outstanding current creative work leading directly to improved health for large numbers of people," has been announced by the American Public Health Association. The prizes have been established with a grant from the Samuel Bronfman Foundation, Inc.

From 1 to 3 prizes will be awarded annually, depending on availability of suitable candidates. Each prize will consist of a $5,000 cash award and a commemorative symbol now being devised. First awards will be announced and presented during the association's 98th annual meeting in Detroit, Nov. 13-17, 1961.

The Bronfman Prizes will be awarded for work of particular effectiveness in applying newer scientific knowledge to community health rather than for achievements in basic or laboratory research.

The Samuel Bronfman Foundation was founded in 1951 by associates of Samuel Bronfman to engage in, assist, and contribute to the support of educational, literary, scientific, charitable, and religious activities and projects. The intention of the foundation to become active in the field of public health was announced by its president, Edgar M. Bronfman, earlier this year.

The American Public Health Association grants only one other award, the annual Sedgwick Memorial Medal in recognition of long and distinguished careers in public health.

Washington State Veterinarians Get Favorable Legislation

Amendments to the Veterinary Practice Act and to the Minimum Wage Act in Washington State during the last legislative session repaid the Washington State V.M.A. for the efforts they had put forth to have these measures adopted.

The Practice Act was amended to provide for 2 additional grounds on which licenses could be suspended or revoked—gross incompetence and violation of the code of ethics of the profession.

The Practice Act was also amended so that the Principles of Veterinary Medical Ethics adopted by the AVMA last August were made the code of ethics for the profession in Washington. The interpretations of the principles by the AVMA Judicial Council have also been adopted by the Washington State V.M.A.

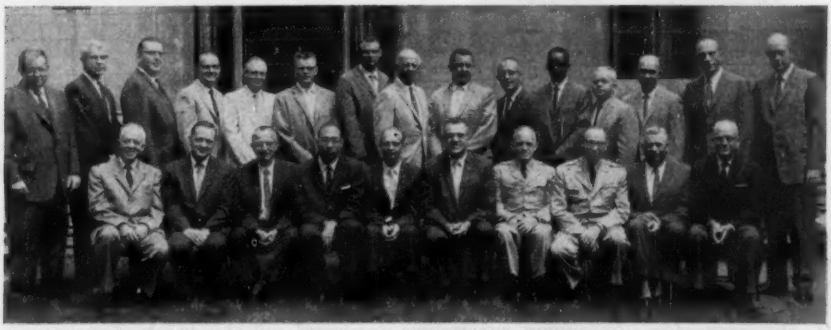
Under the former Minimum Wage Act in Washington, there was a question regarding how many hours a kennelman living on the premises is actually working, particularly since he may be subject to call for emergencies at all hours of the night. To correct this situation the law was amended to exclude from its provisions those individuals residing or sleeping at the place of employment. Workers under 18 are also excluded from the law's provisions.

Meat Hygiene Seminar Held At Chicago

A Meat Hygiene Seminar attended by meat hygiene teachers from 14 of the 18 U.S. veterinary schools was held June 12-16 at the Meat Hygiene Training Center, Chicago. The seminar, sponsored by the Meat Inspection Division, ARS, was the fourth meeting of this type to be conducted for teachers of meat hygiene during the past 13 years. The previous seminars were held in Chicago, July, 1948; Omaha, June, 1954; and St. Paul, June, 1957. The AVMA Council on Education and the Council on Public Health and Regulatory Veterinary Medicine have both encouraged and endorsed the seminar as a means of improving the preparation of veterinary students for meeting their responsibilities as leaders in food hygiene.

The seminar was conducted at International House on the campus of The University of Chicago. International House is the home of the Meat Inspection Division's Meat Hygiene Training Center. Speakers included members of Meat Inspection Division staff, representatives of the Meat and Dairy Hygiene School, the Fifth Army, the Quartermaster Food and Container Institute, Michigan State University, the Poultry Inspection Branch, the Animal Disease Eradication Division, the American Meat Institute Foundation, the American Meat Institute, and a consultant to the meat industry.

The program included discussions of in-



Participants in the Meat Hygiene Seminar held in Chicago last June were (back row, left to right): Drs. R. K. Jones, J. B. Corcoran, P. J. Brandley, R. W. Mohri, G. T. Woods, D. M. Fluharty, R. P. Crawford, Peter Olafson, R. D. Barner, D. O. Jones, A. W. Dade, D. C. Kelley, R. K. Anderson, H. B. Wright, J. H. Stewart.

Front row: Drs. C. H. Kitselman, J. D. Lane, A. R. Miller, V. H. Berry, J. C. deHoll, C. H. Pals, N. F. Christensen, W. E. Jennings, W. D. Murdock, F. P. Jaggi.

spection facilities, inspection procedures, humane slaughter, radiologic contamination of livestock and food, chemical and hormone residues in meat, meat chemistry, biological control measures, statistical sampling, and meat research and development. Much of the program was devoted to an exchange of ideas about course organization and teaching methods by the participants. The educational needs of veterinarians entering civilian and military regulatory positions was also stressed.

Dr. I. A. Merchant Honored

Dr. Ival A. Merchant (COL '24), dean of the College of Veterinary Medicine, Iowa State University, recently received 2 awards in one week.

Dr. I. A. Merchant

Dr. Merchant received the alumnus achievement award at the commencement of the Colorado State University College of Veterinary Medicine. He was awarded a plaque on which was inscribed "Honor Alumnus Award, Colorado State University, 1961. To Dr. Ival A. Merchant, Class of 1924. Honoring: His outstanding scholastic and professional achievement."

That same week he also received the Chicago Alumni Association Merit Award for Iowa State University.

Dr. Merchant was president of the Iowa V.M.A. in 1960. He became dean of Iowa State's College of Veterinary Medicine in 1952. He is the author of several papers and textbooks in the field of veterinary bacteriology and infectious diseases of animals. One of his texts, *Veterinary Bacteriology and Virology*, is used throughout the nation and has been translated into Japanese and Spanish.

Conference Held at Iowa State

About 350 veterinarians from Iowa and nearby states attended the Annual Conference for Veterinarians at Iowa State University, June 20-21, 1961.

New research information on diagnosis and control of animal diseases was presented at the meeting. Closed-circuit television was used for 4 demonstrations. The conference participants toured the new National Animal Disease Laboratory at Ames, where the director, Dr. W. A. Hagan (KSU '15), explained its function in midwestern veterinary problems.

Among speakers on the conference program were Drs. S. J. Roberts (COR '38), Cornell University, who discussed infertility problems; Frank Kral (VI '14), University of Pennsylvania, who talked on skin diseases in small animals and diagnostic procedures in large animals; and W. W. Brown (COL '44), Colorado State University, who conducted 2 sessions on diseases in feeder cattle.

Civil Defense Conference Slated

The 10th annual conference of the United States Civil Defense Council will be held at the Ambassador Hotel, Los Angeles, Calif., Oct. 16-20, 1961.

A demonstration of the Nike Missile System has been arranged for presentation at the conference through the courtesy of Gen. John T. Honeycutt, Fort MacArthur, San Pedro, Calif. More than 200 men from this command will be involved in staging this display. An experimental radiation measurements program has also been scheduled for the meeting through the cooperation of the Office of Civil Defense Mobilization and the

Atomic Energy Commission. The conference fee will be $24.

For those who have a civil defense responsibility, the Office of Civil Defense Mobilizaton has arranged a 3-day training course on "Decision Making in Emergencies," at the Western Instructor Training Center, Alameda, before and after the conference.

These special training sessions will be held October 12-14 and October 23-25. Enrollees will be entitled to 50% reimbursement for travel and for each day of the course under OCDM's student training program. A brochure giving the details of the course can be obtained by writing to Joseph J. Micciche, General Conference Chairman, 6501 Fountain Ave., Los Angeles 28, Calif.

Dr. C. E. DeCamp Takes Grange Post

Dr. C. E. DeCamp (COR '23), Scarsdale, N.Y., joined the Cooperative Grange League Federation, Inc., as veterinary consultant on July 1, 1961.

Dr. DeCamp will be the firm's contact with veterinarians, veterinary colleges, and veterinary societies. The Grange League Federation believes there is an opportunity to increase the income of dairymen through an improved health program for cattle, carried out in cooperation with the veterinary profession.

Illinois Stages Cattle Reproduction Workshop

The College of Veterinary Medicine, University of Illinois, conducted a 3-day short course last July dealing with reproductive diseases of cattle. The course consisted of lecture, demonstration, and workshop sessions.

The 30 veterinarians who attended had the opportunity to examine cows for pregnancy and abnormalities of the reproductive tract. Following these examinations, the reproductive organs were removed at slaughter and the organs made available for reexamination.

Clinical demonstrations were presented and each enrollee participated in laboratory procedures used to diagnose reproductive diseases and abnormalities.

Lectures and demonstrations were presented by Drs. D. E. Bartlett (COL '40), F. H. Oberst (KSU '43), and E. A. Woelffer (COR '31), as well as staff members of the College of Veterinary Medicine.

Dr. C. E. Stevens Joins Cornell Faculty

Dr. C. Edward Stevens (MIN '55) joined the Department of Physiology of Cornell University's New York State Veterinary College on July 15 as associate professor of physiology.

Dr. Stevens, previously with the University of Minnesota, is known for his application of biophysical techniques to the study of physiologic processes in animals. He has recently devised a tiny flowmeter device for measuring the passage of feed materials from one compartment to another of the complex ruminant stomach. His studies on the hydraulic principles of accurate measuring systems, for use in the study of digestion in cattle, have been used as the basis for studies of ruminant digestion in laboratories in various parts of the world.

He received his M.S. and Ph.D degrees in physiology from the University of Minnesota.

Dr. Stevens has served on the U. S. Office of Experiment Stations, North Central Regional Technical Committee. He is a member of the AVMA, the American Physiological Society, and the Research Workers in Animal Diseases. He has served as leader of the U. S. Agricultural Research Service's project on investigations of normal and abnormal conditions affecting the ruminant stomach.

Central Indiana V.M.A. Plans Small Animal Seminar

The Central Indiana Veterinary Medical Association is sponsoring its 7th annual Small Animal Seminar on Sept. 13, 1961.

Two of the speakers are Dr. Robert Knowles (AUB '44), Miami, Fla., who will speak on reconstructive surgery, and Dr. Robert Stansbury (OSU '44), Pasadena, Calif., who will discuss the "Empirical Approach to Feline Practice."

Colonel Stephen G. Asbill Scores Firsts

Colonel Stephen G. Asbill (KSU '35), became center executive officer at Walter Reed Army Medical Center June 9. He is the first member of the Veterinary Corps to hold this position. He was formerly chief of Supply and Services for the center.

Colonel Asbill was also recently named "Logistician, U.S. Army." He is the 1st Veterinary Corps officer to hold this distinction.

He will succeed Col. Michael L. Sheppeck in the executive officer position. Colonel Sheppeck is now in command of the station hospital at Fort Leonard Wood, Mo.

The title of logistician is awarded to field grade officers with considerable experience and an outstanding performance record in the logistics field. Colonel Asbill is one of only 4 Army Medical Service officers to attain this title. He has been a logistics officer since 1940, when he was assigned to the 4th Medical Supply Depot at Fort Sam Houston, Texas.

Laboratory Animal Short Course Planned

A postgraduate short course on "Pathology of Diseases of Laboratory Animals" will be held at the Armed Forces Institute of Pathology, Sept. 25-29, 1961.

Pathology will be the major item of discussion, but etiology, diagnosis, and control of diseases will also be considered.

The course is designed to provide training for professional officers who are responsible for the recognition and interpretation of lesions is experimental animals or have charge of procurement and maintenance of animal colonies.

U.S. Military Veterinarians Meet in Germany

United States Army and Air Force veterinary officers serving in England, Europe, Africa, and the Near and Middle East—80 in all—met in Garmisch, Germany, May 24 to 26, 1961, for the Tenth Annual Training Conference.

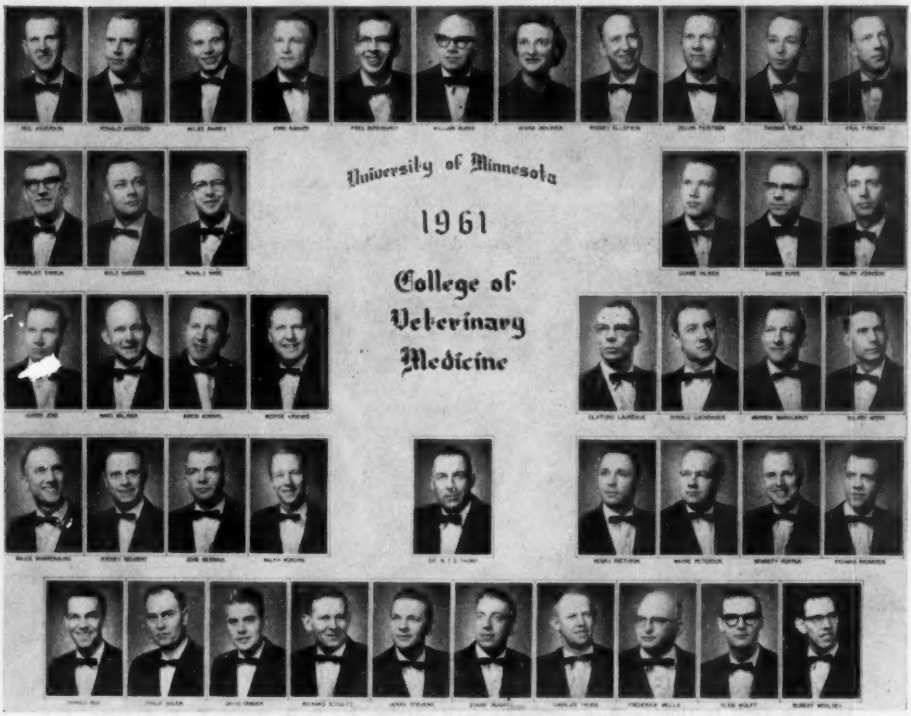
The conference was held in conjunction with the visit to the European area of the chief of the Army Veterinary Corps, Brig. Gen. Russell McNellis (ISU '28).

Highlight of the meeting was General McNellis' speech on personnel, training, education, and promotion, and environmental health situations.

Main topics discussed by the conferees were veterinary training programs, environmental health, standardization of inspection, and emerging animal diseases.

Veterinarians who attended the Tenth Annual Training Conference in Germany are shown here. Leaders of the conference were (front row—left to right) Col. Daniel S. Stevenson, Major Gen. Joseph H. McNinch, Brig. Gen. Russell McNellis, and Col. Marley C. Clark.

Graduating Class, 1961, College of Veterinary Medicine, University of Minnesota



Top row (left to right)—Neil Anderson, Ronald Anderson, Miles Bairey, John Bakker, Fred Borgwardt, William Burke, Donna DenBoer, Rodney Ellefson, Delvin Feistner, Thomas Field, Paul Fynskov

Second row—Charles Gibson, Mylo Hagberg, Ronald Hass, Duane Hilmas, Duane Huwe, Ralph Johnson

Third row—Aanon Jore, Hans Kalinka, Simon Kowahl, George Krienke, Clifford Laurence, Donald Luchsinger, Warren Marquardt, Hilary Mohr

Fourth row—Bruce Muggenburg, Rodney Neubert, John Newman, Ralph Nordine, Dr. W. T. S. Thorp, Henry Pattison, Wayne Peterson, Bennett Porter, Richard Richards

Fifth row—Harold Rud, Philip Salem, David Sanger, Richard Schultz, Jerry Stevens, Edgar Taggatz, Charles Thoen, Frederick Wells, Glen Wolff, Robert Woolsey

University of Minnesota

At the 1961 commencement exercises of the College of Veterinary Medicine, University of Minnesota, 43 candidates received D.V.M. degrees. They were:

Neil V. Anderson
Ronald D. Anderson
Miles H. Bairey
John Bakker
Frederick C. Borgwardt
William T. Burke
Donna L. DenBoer
Rodney L. Ellefson
Delvin C. Feistner
Thomas F. Field
Paul H. Fynskov
Charles D. Gibson
Mylo M. Hagberg
Ronald B. Hass
Duane E. Hilmas
Duane E. Huwe
Ralph A. Johnson
Aanon R. Jore
Hans S. Kalinka
Simon J. Kowahl
George H. Krienke
Clifford C. Laurence
Donald W. Luchsinger
Warren W. Marquardt
Hilary T. Mohr
Bruce A. Muggenburg
Rod F. Neubert
John A. Newman
Ralph A. Nordine
Henry A. Pattison
Wayne R. Peterson
Bennett J. Porter
Richard H. Richards
Harold O. Rud
Philip M. Salem
David P. Sanger
Richard H. Schultz
Jerry B. Stevens
Edgar J. Taggatz
Charles O. Thoen
Frederick M. Wells
Glen G. Wolff
Robert W. Woolsey

Graduating Class, 1961, School of Veterinary Medicine, Texas A. & M. College

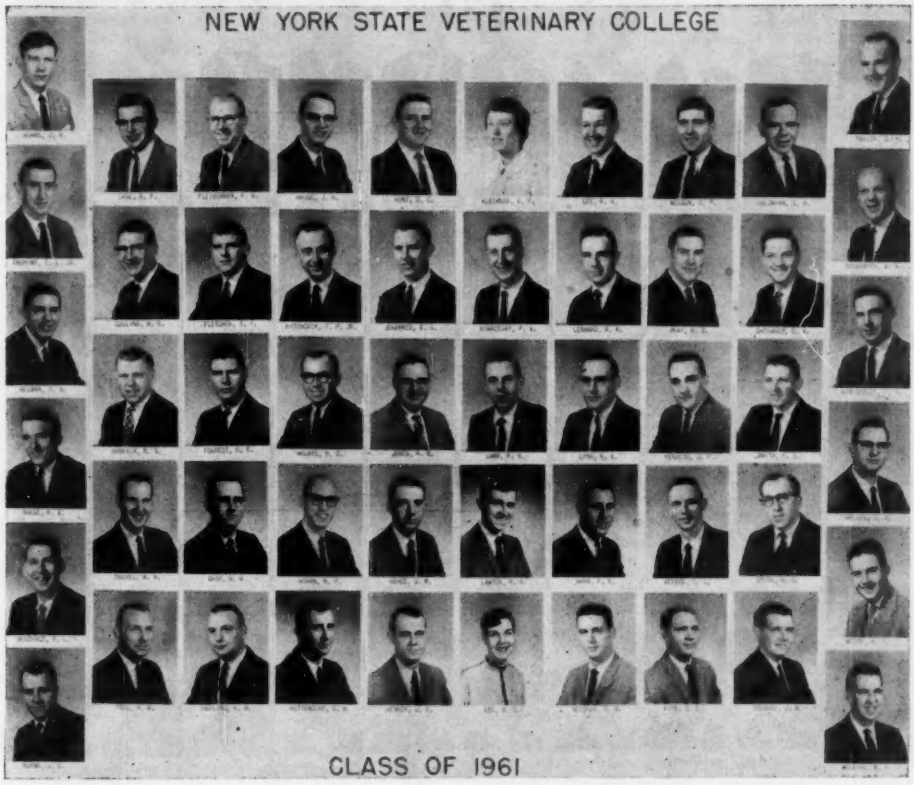
Top row (left to right)—A. P. Andrews, C. H. Arnim, Jr., R. D. Autry, K. V. Beasley, J. R. Brown, W. H. Brown, Jr., C. R. Butler, E. G. Carney, K. R. Clevenger, A. R. Dommert
Second row—R. D. Eaton, J. A. Ellsworth, N. G. Ferrell, R. W. Field, E. G. Ford, N. L. Gates, J. E. Gill, R. L. Glaze, C. W. Graham, J. E. Hall
Third row—E. W. Hardy, T. K. Hardy, R. W. Hargroder, J. W. Harris, J. M. Heald, Jr., J. T. Jones, W. D. Kent, J. A. Kirschke, R. S. Lacy, J. B. Laird
Fourth row—J. F. Love T. W. McCorcle, M. C. McCullin, J. E. Martin, M. A. S. Mia, O. L. Oliver, Jr., A. G. Olire, R H. Ragsdale, D. W. Schultze, F. B. Shivers
Fifth row—J. B. Smith, R. M. Smithwick, A. D. Speyrer, E. H. Stephenson, B. R. Still, B. A. Stumbo, R. A. Vosdingh, C. D. Williams, W. G. Winkler, T. L. Wolfle

Texas A. & M. College

At the commencement exercises of the School of Veterinary Medicine, Texas A. & M. College, 50 candidates were presented the D.V.M. degree. They were:

Archie P. Andrews
Cecil H. Arnim, Jr
Richard D. Autry
Kennith V. Beasley
Johnny R. Brown
William H. Brown, Jr.
Charles R. Butler
Ewart G. Carney
Kenneth R. Clevenger
Arthur R. Dommert
Riley D. Eaton
Jerry A. Ellsworth
Nathan G. Ferrell
Robert W. Field
Ellis G. Ford
Norman L. Gates
Jimmie E. Gill
Robert L. Glaze
Charles W. Graham
James E. Hall
Ernest W. Hardy
Tom K. Hardy
Richard W. Hargroder
John W. Harris
Jack M. Heald, Jr.
James T. Jones
Warren D. Kent
John A. Kirschke
Roger S. Lacy
James B. Laird
James F. Love
Thelton W. McCorcle
Mack C. McCullin
John E. Martin
M. A. S. Mia
Obie L. Oliver, Jr.
Albert G. Olire
Robert H. Ragsdale
Donald W. Schultze
Franklin B. Shivers
Joseph E. Smith
Richard M. Smithwick
Allen D. Speyrer
Ed H. Stephenson
Bobby R. Still
Barney A. Stumbo
Ralph A. Vosdingh
Charlie D. Williams
William G. Winkler
Thomas L. Wolfle

Graduating Class, 1961, New York State Veterinary College, Cornell University



Left side down—J. W. Adams, E. L. Andrews, Jr., S. G. Belman, R. A. Boese, F. L. Boudinot, J. G. Burns.

Top row (left to right)—R. F. Case, R. W. Fleischman, J. H. Hauge, D. C. Hunt, V. F. Kleckner, R. K. Lee, C. P. Nelson, G. B. Salzmann.

Second row—W. E. Collins, T. F. Fletcher, F. P. Hitchcock, Jr., E. L. Johannes, P. V. Kowaleski, A. A. Lenhard, R. S. Pray, D. K. Sherwood.

Third row—D. G. Dedrick, R. E. Forrest, M. D. Holmes, R. E. Jones, R. B. Lamb, R. E. Lynk, J. P. Renaldo, R. S. Smith.

Fourth row—W. W. Dubiel, B. W. Gray, M. P. Horan, J. M. Kehoe, R. R. Lawton, F. A. Mann, L. S. Roemer, N. D. Stock.

Fifth row—H. W. Fell, R. W. Harling, G. H. Hottendorf, J. S. Kenny, B. C. Lee, D. W. Needham, C. E. Rofe, J. M. Strauss.

Right side down—D. H. Taylor, W. K. Trumbauer, F. K. Van Deusen, D. U. Walker, W. T. Weber, M. B. Wooding.

Cornell University

At the commencement exercises of the New York State Veterinary College, Cornell University, 52 candidates were presented the D.V.M. degree. They were:

Joseph W. Adams
Elmore L. Andrews, Jr.
Stefan G. Belman
Richard A. Boese
Frank L. Boudinot
James G. Burns
Robert F. Case
Walter E. Collins
Douglas G. Dedrick
William W. DuBiel
Harold W. Fell, Jr.
Robert W. Fleischman
Richard E. Forrest
Bruch W. Gray
Ronald W. Harling
John A. Hauge
Floyd P. Hitchcock, Jr.
MacDonald J. Holmes
Michael P. Horan
Girard H. Hottendorf
Donald C. Hunt
Eugene L. Johannes
Robert E. Jones
John M. Kehoe
John S. Kenney
Virginia F. Kleckner
Paul V. Kowaleski
Robert B. Lamb
Richard R. Lawton
Beverly W. Lee
Robert K. Lee
Aloysius A. Lenhard
Robert E. Lynk
Floyd A. Mann
Donald W. Needham
Charles P. Nelson
Raymond S. Pray
Joseph P. Renaldo
Leroy S. Roemer
Calvin E. Rofe
George B. Salzmann
Donald K. Sherwood
Richard S. Smith
Neale D. Stock
Julian M. Strauss
David H. Taylor
Walter K. Trumbauer
Fred K. Van Deusen, Jr.
David U. Walker
Wilfried T. Weber
Merritt B. Wooding

Graduating Class, 1961, College of Veterinary Medicine, Ohio State University

Top row (left to right)—D. A. Apel, B. L. Bassette, K. C. Bovee, J. F. Boyd, D. L. Brockett, R. D. Buller, W. Bumgarner, Jr., J. Buroker, J. E. Connolly, H. D. Crocker.
Second row—R. C. Cutlip, W. E. Delph, G. S. Dill, Jr., N. M. Dorko, J. R. Duncan, D. N. Ebert, A. W. Fetter, A. A. Gaddis, L. E. Glasso, S. R. Grim.
Third row—R. Gustin, D. L. Hanson, T. M. Hayes, J. H. Hennegan, W. B. Henry, Jr., W. E. Hess, P. J. Hirt, R. C. Hummel, P. A. Karns, D. G. Kelch.
Fourth row—K. M. Kerr, G. W. Lake, P. H. Knapp, W. K. Latshaw, T. R. Mack, R. F. Mairs, C. R. Maret, G. C. Marsh, E. E. McConell, J. P. Miller.
Fifth row—R. L. Miller, J. P. Mozena, D. C. Notter, E. K. Owen, J. F. Park, P. N. Perrel, A. C. Peters, G. B. Reddin, Jr., J. T. Rosshirt, W. E. Sanders.
Sixth row—E. R. Seaman, L. D. Skinner, D. L. Smetzer, R. K. Soughers, W. T. Sweeny, W. M. Taylor, S. R. Thomas, P. J. Weber, G. B. Wenning, R. E. Wilkins.
Seventh row—R. A. Wright, R. Yeagle, W. L. Yerse, L. C. Zilles.

Ohio State University

At the commencement exercises of the College of Veterinary Medicine, Ohio State University, 67 candidates received their D.V.M. degrees. They were:

David A. Apel
Buell L. Bassette
Kenneth C. Bovee
James F. Boyd
David L. Brockett
Rex D. Buller
Walter Bumgarner
John P. Buroker
Julian E. Connolly
Harold D. Crocker
Randall C. Cutlip
Robert W. Davison
Wilbur E. Delph
Garrett S. Dill
Nicholas M. Dorko
James R. Duncan
Daniel N. Ebert
Arthur W. Fetter
Austin A. Gaddis
Laurel E. Clasgo
Stanley R. Grim
Philip Gustin
Donald L. Hanson
Theodore M. Hayes
Jimmie H. Hennegan
William B. Henry
William E. Hess
Paul J. Hirt

Ohio State—Cont'd.

Robert C. Hummel
Phillip A. Karns
Donald G. Kelch
Kirklyn M. Kerr
Paul H. Knapp
George W. Lake
William K. Latshaw
Thomas R. Mack
Robert F. Mairs
Charles R. Maret
General C. Marsh
John P. Miller
Robert L. Miller
John P. Mozena
Ernest E. McConnell
Danny C. Notter
Eugene K. Owen
James F. Park
Neil Perrel
Arthur C. Peters
George B. Reddin
Steven V. Repasy
James T. Rossbirt
William E. Sanders
Earl R. Seaman
Lawrence D. Skinner
David L. Smetzer
Richard K. Soughers
Curtis B. Sousley
William T. Sweeny
William M. Taylor
Samuel R. Thomas
Paul J. Weber
George B. Wenning
Robert E. Wilkins
Ronald A. Wright
Rudolph Yeagle
William L. Yerse
Leland C. Zilles

University of Pennsylvania Graduates

At the commencement exercises at the School of Veterinary Medicine, University of Pennsylvania 47 candidates were presented the V.M.D. degree. A composite picture of these graduates is not available. Their names are listed below:

Donald Abrutyn
Donald A. Abt
John Burlein
Charles D. Clark
Andrew Cullen
Francis W. Daniel
Burt G. Dickenson
Harriet A. Doolittle
Edwin W. Dull
William E. Eccleston
Paul A. Evans
Nick A. Fisfis
John Fisher
Alvin Fishman
Oliver J. Ginther
Barton L. Gledhill
Joseph R. Godzik
Edward J. Gralla
Peter J. Hand
Joseph S. Hansen
Edward L. Hitz
Lon D. Hodge
Lawrence R. Honeywell
Edwin V. Jeszenka
John W. Kenline
William H. Kirkpatrick
Richard Klesmer
Peter W. Laffan
William H. Larsen
Leon L. Lewis
Morton G. Linder
Richard A. McFeely
Edward Mersky
Robert K. Morrison
Leo W. Minisce
Hugh A. Moore, Jr.
Leo A. Prill
Harry C. Reichard
Barnard Sass
Harry R. Smalley
George Spatz
M. Joyce Stevens
John S. Stratton
Peter Theran
Pierre H. Thouin
Louis W. Wasser
Ronald E. Yoxheimer

State Board Examinations

HAWAII—Sept. 7-9, 1961, Honolulu, Hawaii. Board of Veterinary Examiners, P.O. Box 3469, Honolulu, Hawaii.

Deaths

Star indicates member of AVMA

★**Harry C. Millar** (UP '94), 90, pioneer veterinarian of Monmouth County, N.J., and prominent in the civic, religious, and professional affairs of his community and state for many years, died on June 16, 1961.

Dr. Millar received his V.M.D. degree from the University of Pennsylvania, first practiced in Jenkintown, Pa., and then established himself in Asbury Park, N.J. In 1930, he and his son, Dr. Joseph A. S. Millar (UP '23), opened the Millar Animal Hospital in Deal, N.J.

He was past-president of the New Jersey V.M.A.; veterinary medical representative on the General Alumni Board, University of Pennsylvania; a member of the Keystone (Pa.) Veterinary Society; and for many years served on the New Jersey State Veterinary Medical Examining Board. He joined the AVMA in 1924 and was made a life member in 1953.

Dr. Millar was an outstanding example of the busy, successful professional man who believed strongly in public service and, in carrying out his responsibility, exerted a most wholesome influence in the entire community.

Glenn R. Deeren (CVC '15), 67, Taylorsville, Ill., died May 28, 1961.

Dr. Deeren had maintained a small animal practice in Taylorsville for 39 years.

★**George W. Hess** (TH '18), 65, of Terre Haute, Ind., died May 21, 1961.

Dr. Hess had been employed by the former Bureau of Animal Industry.

Rosser Lane (KCV '17), 67, Wilson, N. Car., died April 15, 1961.

Dr. Lane had retired 10 years ago.

Women's Auxiliary

Your Delegate Is Your Voice in Serving the Veterinary Profession

"My hope is that our union will be made still firmer in the interest of the profession of our husbands in order that their role in the world economy will be better understood and better appreciated. It is for me an immovable or inexhaustible source of joy, that of feeling the warmth of our intent, and of seeing the founding of new groups of wives of veterinarians across the world, and is a source of pride."

The above quote is part of a letter written by Mme. E. Godechoux, Paris, France, president of the International Women's Auxiliary, and read at the Women's Auxiliary meeting in Denver last August.

This points up the fact that we are a team, beginning with local auxiliaries, on to regional and state, and finally as national and international auxiliaries.

When our national "team" met in Denver last year we had the largest number of delegates ever present—a total of 110. We are preparing for an even larger representation this year at Detroit.

Duties of Delegates

Your delegate is your voice in determining how the auxiliary can best serve the professional needs of the veterinary profession. A formal list of duties of delegates has been drawn up so that all delegates will uniformly and efficiently serve the associations they represent. Here are the rules delegates follow:

1. The House of Delegates is the legislative body of the Auxiliary, and is, in principle, the voice of the active members. Its vote, carried out in accordance with the customary parliamentary procedure shall be final; provided, however, that no matter shall be acted upon by the House unless the matter has been considered and reported upon by the Executive Board. Any matter so referred must be reported upon by the Executive Board either at the annual business session during which the matter is so referred, or at the next following session.

2. The House of Delegates is composed of the delegates selected by the constituent auxiliaries.

3. Each certified delegate shall have 1 vote. She shall act for her constitutent auxiliary in the House of Delegates to maintain a continuous liaison between her constituent and this auxiliary, and to assist in enlarging the membership of both organizations.

4. Only certified delegates may vote, and each should have a thorough knowledge of the agenda of the House.

5. Each delegate is urged to attend the business meeting and the Auxiliary Workers Conference.

6. Certified delegates are representatives from their auxiliaries, and as such, are obligated to report to their president immediately after the annual meeting of the Women's Auxiliary to the AVMA on matters affecting their respective auxiliaries.

The women who serve as delegates are, as individuals and as a group, dedicated, sincere, and conscientious in serving their own auxiliaries as well as the national Auxiliary.

Honor Roll

There were 19 constituent auxiliaries and 8 regional auxiliaries qualifying for 100% on the Honor Roll this year. The auxiliaries and their delegates are:

Delaware	Mrs. M. S. Cover
Florida	Mrs. C. E. Bild
Illinois	Mrs. W. R. Pritchard, Mrs. J. J. Smith, Mrs. G. I. Case Mrs. Carl Vaupel, Mrs. E. C. Hannan, Mrs. C. H. Horstman, Mrs. H. W. Boothe, Mrs. W. G. Raudabaugh
Indiana	Mrs. R. W. Hardin, Mrs. Frank Gossett, Mrs. J. J. Fishler, Mrs. Forrest McClead, Mrs. O. B. Curry
Kansas	Mrs. K. M. Curts, Mrs. A. V. Schwartz, Jr., Mrs. T. J. Leasure, Mrs. R. E. Bogue
Kentucky	Mrs. H. A. Gray, Mrs. Horace David
Louisiana	Mrs. J. M. Dixon, Mrs. R. B. Lank
Maine	Mrs. A. E. Coombs
Minnesota	Mrs. O. B. Gochnauer, Mrs. C. H. Wetter, Mrs. R. L. Kitchell, Mrs. D. H. Spangler, Mrs. Ben Pomeroy
Missouri	Mrs. C. H. Commings, Mrs. E. F. Ebert, Mrs. Wayne Chapin, Mrs. Richard Keith, Mrs. P. L. Spencer
New York	Mrs. Irving Zimmerman, Mrs. C. E. Fletcher, Mrs. Dubois Jenkins, Mrs. M. G. Fincher, Mrs. George Dorney
N. Car.	Mrs. E. G. Batte, Mrs. J. I. Neal, Miss Jaimie Cornwell
N. Dak.	Mrs. James Vagneur
Oklahoma	Mrs. E. W. Jones, Mrs. Jack Southall, Mrs. John Venable
Oregon	Mrs. E. R. Derflinger, Mrs. D. H. Jones
S. Car.	Mrs. M. R. Blackstock
S. Dak.	Mrs. W. L. Adrian
Utah	Mrs. D. S. Dennis, Mrs. R. A. Nipko
Washington	Mrs. Fred Shigley, Mrs. T. J. Guilfoil, Mrs. C. R. Griffith, Mrs. E. C. Stone

Regional auxiliaries that attained 100% on the Honor Roll are: Central Illinois, Chicago, Eastern Illinois, Michiana, Mississippi Valley, Seattle, Southern States, and South Puget Sound.

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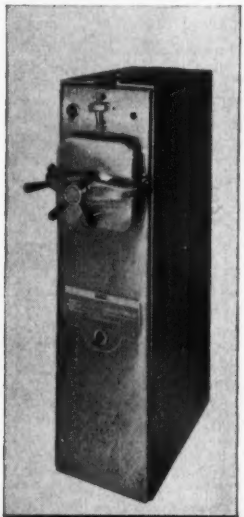

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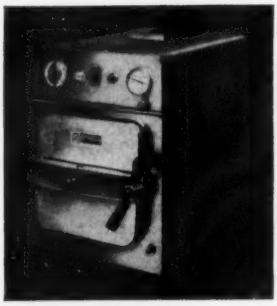

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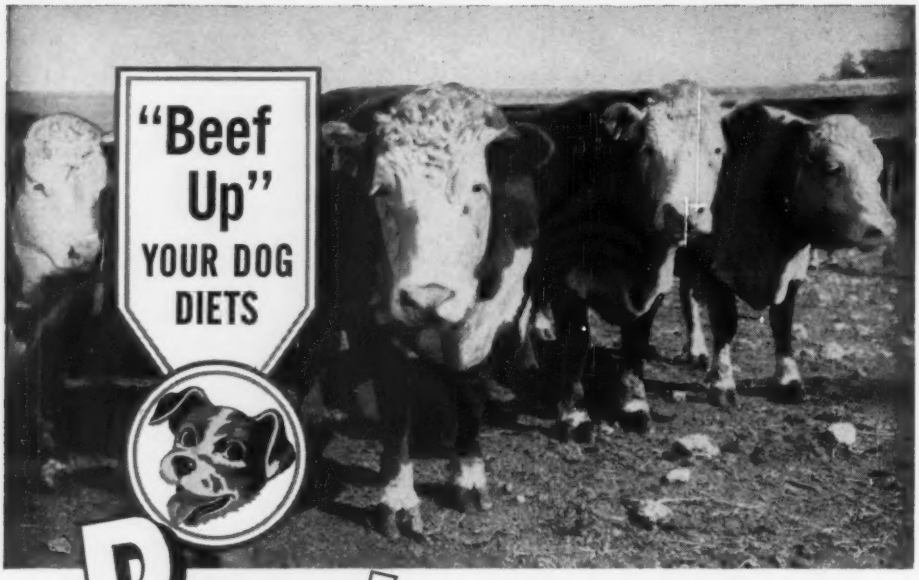

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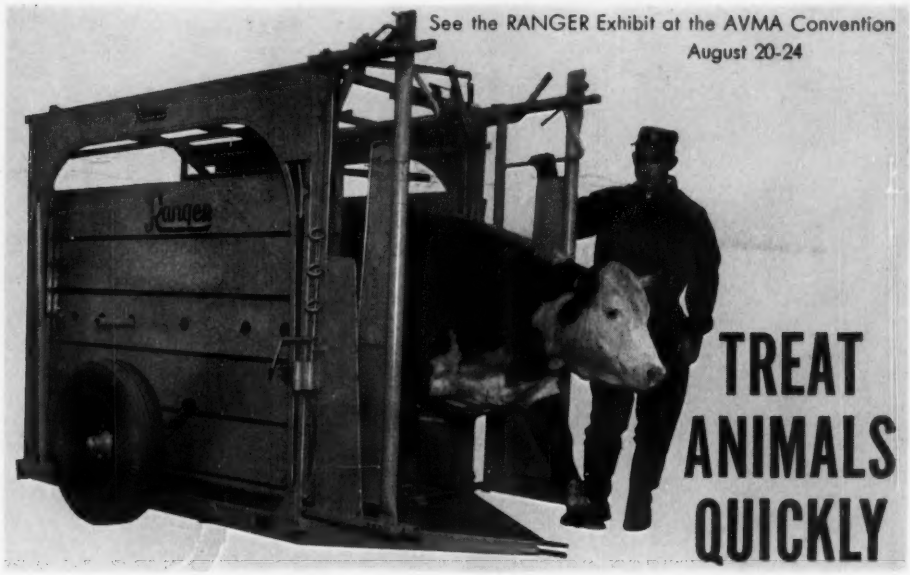

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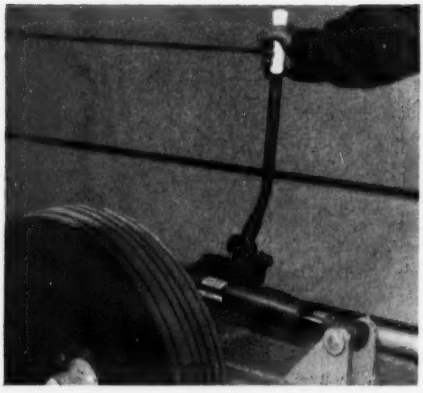

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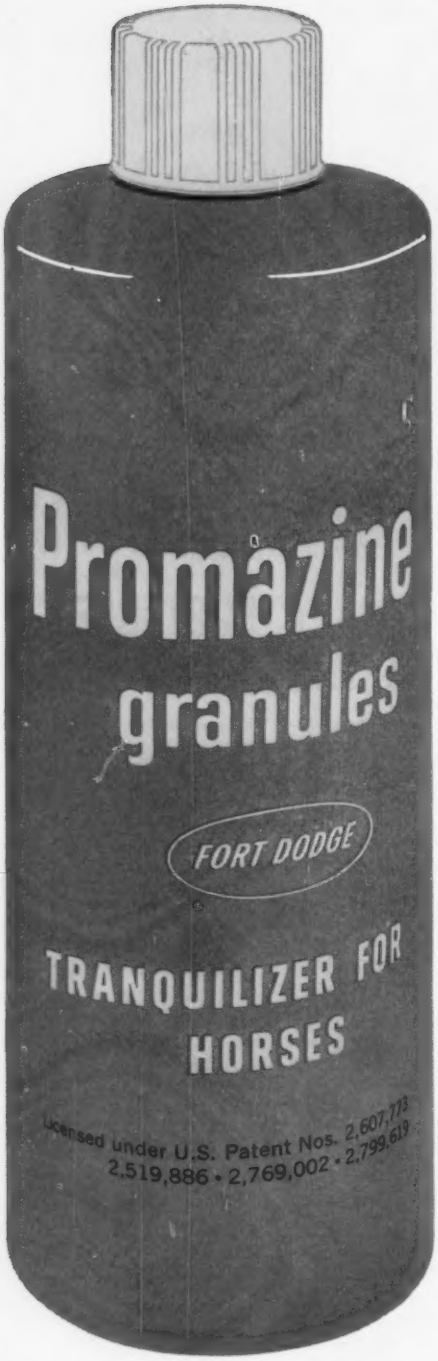

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references:

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August 15, 1961

Journal

OF THE AMERICAN VETERINARY MEDICAL ASSOCIATION

Animal Hospital Zoning Problems

John I. Cofer, B.C.E., LL.B.

TEXAS newspapers recently carried an item regarding a successful suit by neighbors to enjoin a Dallas resident from keeping too many dogs on her property. The owner denied that the 73 dogs created a "stench" or attracted flies, but she was quoted as admitting that "As for barking, the only dog that doesn't bark is a dead dog."

This story may very well sum up the public attitude which has resulted in the zoning problems of animal hospitals.

Zoning regulations are usually in the form of ordinances or resolutions passed by the local legislative body. The community is divided into districts, or zones, and certain groups of theoretically compatible uses are permitted in each of these zones. The regulations also cover such additional matters as yard space, height and bulk of buildings, density of population or minimum lot area per family, and off-street parking and loading. Provision is made for a board of adjustment or board of appeals to handle special cases where practical difficulties or unnecessary hardship would result from strict application of the terms of the regulations to a particular property. The regulations should be based on a comprehensive plan for land use, but as often as not the land use plan is found in the zoning ordinance itself.

This type of regulation is relatively new, having been in widespread use only about 30 years. Most sizeable towns and an increasing number of counties now have zoning regulations in effect, but the handling of specific uses is far from uniform. This is true for animal hospitals. For some years, the American Animal Hospital Association has become increasingly concerned with zoning as members report mounting difficulties in complying with zoning regulations when attempting to build new animal hospitals.

Zoning Ordinances

In an effort to determine the scope of the problem, we reviewed 100 zoning ordinances chosen at random from our files; some were prepared by our firm, some were prepared by others. The ordinances were enacted or proposed in 29 states. About ¼ of these did not mention animal hospitals at all. Of those which did mention animal hospitals, 30% permitted them in the local, or neighborhood, business district and, of these, 64% did not permit open kennels. Forty-nine per cent of the ordinances permitted animal hospitals in a general commercial district and 43% of these ex-

The author is an associate partner in the city planning firm of Harland Bartholomew and Associates, St. Louis, Mo. This article is adapted from remarks made by the author at the 28th Annual Meeting of the American Animal Hospital Association on April 21, 1961, at St. Louis, Mo.

cluded open kennels from the general commercial district. Seldom was there any specification as to the size or type of animal to be treated.

Where the ordinance did not mention animal hospitals specifically, by implication they were relegated to a general commercial district in almost every case. Thus it may be said that in roughly 2 of every 3 cities the animal hospital is limited in location to the general commercial districts. Since this "commercial" district is often the equivalent, in uses permitted, of a light industrial district, the locational problem can be a serious one from the standpoint of the hospital operator, especially if he desires to build in a suburban area. He is doubtless perplexed with these difficulties if the structure he proposes has none of the objectionable features commonly associated with his work or with other commercial and industrial uses permitted in the district.

A number of the ordinances contained rural or agricultural districts applicable to outlying areas where little urban development has occurred. The district regulations frequently permitted animal hospitals and kennels without distinction and, again, with no reference to the size of animals which could be treated. In half of these ordinances, no additional restrictions of any kind were imposed. Where limitations were imposed on the permitted use, a minimum land area was required, say 10 acres, or the buildings or kennels were required to be set back a specified number of feet from property lines. As more counties adopt zoning, contact with rural zoning will be more frequent.

Eight per cent of all ordinances reviewed handled the matter of animal hospitals at least partly by a special permit procedure whereby each application is reviewed on its merits by a zoning administrator, a planning commission, or a legislative agency. In the newer regulations, there is a growing tendency to establish "performance standards" for a variety of uses, recognizing that the manner in which a particular land use is conducted is more important than the name of it.

The general commercial district to which animal hospitals are most often confined usually lies in the central part of the city or in strips along major streets and highways. From the standpoint of accessibility, this is not necessarily a handicap since an animal hospital can serve a wider area than a single neighborhood. On the other hand, the environment might leave much to be desired since the district may contain a great clutter of uses, garish signs, drive-ins, truck terminals, warehouses, plumbing shops, and the like. In shallow strip zones, residences may be close back-fence neighbors.

If the review of the existing zoning situation in these 100 communities can be summarized, one main point is apparent: The public, through their zoning authorities, is highly suspicious of the open kennel and, for this reason, has imposed unnecessarily harsh restrictions on the animal hospital. Two trends are evident: (1) more careful treatment of each land use based on ability to comply with standards, and (2) extension of zoning controls to rural areas. As the latter trend gathers strength, there will soon be no place to "hide" from zoning.

Choosing a Location

An important objective of organized veterinary medicine, and its members as individuals, should be to seek the widest possible range of choice in the location of the small animal hospital, both to provide better service to the public and to reduce operational and financial problems. If you believe this objective is worthwhile, and if you wish to accelerate the date of its accomplishment, then you must undertake a well-planned and consistent program directed with greatest intensity toward yourselves, and simultaneously toward the public generally, the officials in government who ultimately pass on zoning regulations, and the technicians, lawyers, and planners, who assist officials in drafting zoning regulations.

Important groundwork for this program has already been laid by the forces contributing to the urbanization of our country. Increasing numbers of people are moving to the suburbs and all types of uses are following them. Many of our cities are actually "recentralizing" in suburbs. The early idea of suburbia having only single-family homes and retail stores is being replaced by the idea of an entire range of land uses integrated into suburban development. In suburban United States, where most new animal hospitals are being built, increased awareness of the value of medical

services has extended to include the family pets, so that the services of a qualified veterinarian are more frequently sought than in the past. Furthermore, the suburbanite desires the same convenience for this service as he does for the services of his physician, his dentist, or his grocer. Thus half of the battle has been won in that the desire for convenience exists for a widely accepted service.

The first part of the program consists of making the service acceptable to suburban neighbors by building better hospitals. The potential for adverse external effects of an animal hospital are perfectly clear to any citizen or city official and are most easily dealt with by exclusion of the possible source of trouble. Avoidance of odor and noise and, for that matter, traffic congestion and dust, are some of the traditional and most frequently mentioned purposes of zoning laws. Few people are inexperienced in the manner in which odor and noise can be created by animals. Urbanites, in general, are notably unsympathetic to the creation of either effect, especially if the creator happens to belong to somebody else. (When my trusted friend roars at the mailman, it is simply a minor confusion in his noble duty to protect my property; but if that yapping little monster next door ever sets foot in my yard again, I shall take great pleasure in squashing it with a ball bat!) This same attitude carries over into business districts as well.

An extensive boarding kennel is not a necessary adjunct to a hospital. The effect of odor and noise can be eliminated completely by enclosing all facilities, including exercise yards, of an animal hospital in a sanitary, sound-proof building. This must be done if the hospital is to be accepted as company for a residence or for a fine retail store in a modern shopping center. The effect of traffic congestion need be no more than for a physician's office, which receives much more favorable treatment in zoning ordinances. This effect can be reduced by provision of convenient access ways and adequate off-street parking.

Design of Building

In the design of a hospital, wherever it may be located, avoid building boxes that look like packing plants. Engage a good architect and call on the experience of your professional organization to help plan the arrangement and design of needed facilities. Architecture and exterior appearance are often said to be purely aesthetic, leaving too much to individual taste and, therefore, outside the scope of zoning or any other legislation. This is only partly true. The courts show an increasing tendency to recognize aesthetics as a basis for zoning regulations. Appearance affects attitudes, attitudes affect property values, and protection of property values is a widely recognized purpose of zoning. Although it may be years before you have contact with a zoning regulation which establishes architectural standards, it certainly behooves the builder of an animal hospital to build the most attractive building possible in order to create a record of community acceptance.

The consistent observance of high standards of design is the major part of your approach to zoning officials. If the existing zoning ordinance in your community is inadequate, make sure your officials know that the objectionable effects of animal hospitals can be eliminated. Invite them to visit a well-designed and -managed hospital in your area or a nearby community and suggest that the existing ordinance be amended as necessary. You should not wait until you are in trouble on a particular application. Ordinarily the text of the ordinance is more easily amended than a spot on the zoning map, and this more easily accomplished in a calm, objective discussion than in the heat of debate involving a particular piece of property.

Revision of Zoning Regulations

Most cities recognize that a periodic, comprehensive revision of zoning regulations is necessary. This revision is usually assigned to technicians, consultants, or members of the staff of the planning commission or the city attorney's office. If consultants are engaged, all 3 groups will be involved. These undertakings are given ample publicity and present the veterinarian with an ideal opportunity to meet the technicians to discuss inadequacies in existing or proposed zoning controls. With many other land use problems to consider, it is quite possible that the technician has never given any special thought to animal hospitals and acceptance of this use in a

more restricted category. Because of my recent contacts with members of your profession, I, as one of the technician group, will certainly give more careful consideration to the matter in the future.

A carefully drafted zoning ordinance has many interrelated parts. The form can vary considerably depending on the experience of the draftsman. The number and arrangement of districts varies greatly depending on the pattern of land uses in the community and the organization of the future community which the draftsman hopes to achieve. For these reasons, I would not recommend that the Association draw up standard or "model" provisions regarding animal hospitals and attempt to have these put into effect in cities across the nation. Rather, I would recommend that you work to establish certain principles with local authorities and technicians and request their assistance in making necessary changes in the zoning code best suited to local conditions.

The principles to be established are these:

1) A distinction should be made between veterinary establishments which will handle large animals and those which will handle only small animals. A practice involving large animals should be maintained only on a large tract of ground, generally in a rural area.

2) A distinction must be made between establishments which maintain open kennels and those which do not. Open kennels should accept assignments to heavy commercial and industrial districts or, in rural areas, to a large enough tract of land as to make them virtually soundproof at the boundaries of the tract. In urban areas, it may be necessary for the open kennel to accept the additional requirements of impervious floors and enclosure by a high masonry wall, depending on local circumstances.

3) A hospital for small animals should be a permitted use in any zoning district which permits retail stores if it is completely enclosed in a soundproof building and operated in such a way as to produce no objectionable odors outside its walls. Under these conditions, it may be possible in certain locations to permit a small animal hospital in any district where office buildings are permitted.

Under all circumstances, off-street parking should be provided in accordance with the terms of the ordinance, and highest architectural and landscaping standards should be maintained for grounds and buildings.

The transformation of several thousand zoning ordinances will not occur overnight. However, if you care enough to set high standards for yourselves and inform the public and its representatives of your progress, the zoning problems of animal hospitals should become much less difficult.

Proprietary Depilatory Agent Proved Effective

Trials involving 526 dogs, 10 cats, 6 Thoroughbreds, 3 Percherons, 7 light crossbred horses, 8 mules, 4 cattle, and a number of sheep were conducted to determine the efficacy of a depilatory cream containing calcium thioglycollate.* The results indicated that this chemical depilatory agent could be used successfully on dogs, cats, horses, and sheep. It proved especially useful on the ventral abdomen of the dog with regard to time and labor saved. Parts difficult to shave or clip—around the ears and on the feet and lower legs of small animals, and the lower limbs of horses—were depilated quite conveniently.

The preparation was considered too irritating to use on cattle, some Thoroughbreds, and on the scrotums of dogs and cats. To determine safety of the agent, a small spot may be depilated on a trial basis. If the spot remains free from irritation 24 hours later, the depilatory agent may be used safely on larger areas.

Effects of the chemical were determined not only by gross examination of the treated areas, but also by microscopic examination of tissues collected by biopsy from the treated areas.—*J. South African V. M. A., 31, (Sept., 1960): 391.*

*"Nair," Carter Products, Inc., New York City, N.Y.

Hypertrophic Pulmonary Osteoarthropathy in Dogs

J. P. Thrasher, D.V.M.

HYPERTROPHIC pulmonary osteoarthropathy has been recognized as a clinical entity in man, but the cause remains obscure. Since 1890, when the syndrome in man was described,[13] it has been reported in the horse, cow, sheep, dog, cat, fowl, lion, and deer.[14] It has been described more frequently in man than in the dog[5] and is considered rare in dogs.[12,13] According to some authorities, osteoarthropathy occurs more often in the larger breeds of dogs, especially those used for hunting.[5]

The purpose of this report is to provide additional information and to emphasize that diseases causing pulmonary congestion may be accompanied by a secondary or tertiary syndrome of hypertrophic osteoarthropathy. The 3 cases reported here were selected because the primary lesions associated with hypertrophic changes of long bones involved clinically 3 different etiologic mechanisms.

Eighteen cases of pulmonary osteoarthropathy of the dog have been reported in the *J.A.V.M.A.* since 1942.[1,2,4,6,8,10,12,15] Ten of these involved primary lung neoplasms; 5, metastatic tumors in the lung; 1, heart disease; 1, esophageal disease; 1, pulmonary tuberculosis; and 1, carcinoma of the liver with atelectasis of the lungs (Table 1).

Case Reports

Dog 1.—On Aug. 26, 1957, a male dog of mixed breeding, 11½ years old and weighing 12 kg., was admitted to the hospital. The dog had swollen legs and a stiff gait. There was an occasional cough which the owner considered normal since the dog was a chronic barker. There was firm, symmetrical swelling of all 4 extremities, but there were no detectable signs of pain when the joints were flexed. The dog was a cryptorchid, with the testes in the abdominal cavity, a fact determined at the 1st examination in 1947. Although the dog had been given veterinary care periodically for the last 10 years, there had been no serious illness or surgery. A diagnosis of pulmonary osteoarthropathy was confirmed by radiographs (Fig. 1-3).

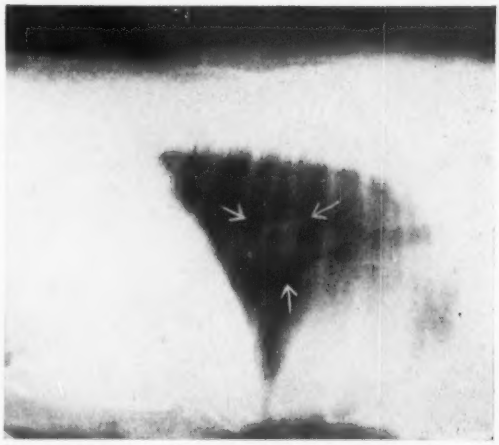

Fig. 1—Lateral radiograph of thorax of dog 1. Arrows indicate tumor mass in diaphragmatic lobe of the lung.

The owner was informed of our findings but did not wish to have the dog euthanatized. He requested palliative treatment. Although the pulmonary neoplasm was not identified, roentgenotherapy was suggested. A total of 4,200 r with a half-value layer of 0.5-mm. copper was administered in 7 weekly treatments. Radiographs of the thorax did not reveal changes in the neoplasm after therapy.

The dog did not appear depressed, lose weight, or have signs of illness, with the exception of the increasing enlargement of all 4 extremities. On Dec. 11, 1957, the dog died.

At necropsy, there were firm tumor masses in the medial-dorsal aspect of both the right and left diaphragmatic lobes of

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the lungs. The mass in the right lung measured 4 cm. in diameter, and the one in the left lung was 3 cm. in diameter. The bronchial lymph nodes seemed enlarged, were firm and, when cut, there was a gritty sensation. The testes were located in the abdomen and appeared atrophic. The skin was removed from the legs; there was mucoid degeneration of the subcutaneous tissue. This tissue was white and in the deeper layers cut similar to cartilage. The articular surfaces of the joints were normal.

Radiographs of the legs were made at the time of necropsy. Advanced changes of the subperiosteal proliferations were striking (Fig. 4 and 5).

Histopathologic diagnosis of the pulmonary lesions was bronchiolar carcinoma of the lung with metastasis to the regional lymph nodes.

Dog 2.—This dog was a female of mixed breeding, 12 years old and weighing 10 kg.* The history of this patient was vague. A tumor mass involving the mammary gland had been removed from the right axillary region in the summer of 1958. A histopathologic diagnosis was not made. At the time of admission to this hospital, the dog walked with a stilted gait, had a distressed, pinched look in the face, and held its ears rigidly erect as in tetanus. All 4 extremities were symmetrically enlarged. On radiographic examination of the thorax, multiple dense masses were evident throughout all lobes of the lungs. The masses predominated in the right lung, with the heaviest concentration in the right diaphragmatic lobe (Fig. 6). On radiographic examination of the long bones of

*Referred by H. C. Melius, D.V.M., New Orleans, La.

TABLE 1 — Data on 21 Cases of Hypertrophic Pulmonary Osteoarthropathy in Dogs Reported in the *J.A.V.M.A.* from 1942 to 1960

Breed	Sex	Age (yr.)	Pathologic findings
Pointer[10]	M	4	Benign bronchogenic giant cell tumor*
German Shepherd Dog[12]	F	8	Alveolar adenocarcinoma*
Hound[12]	M	10	Osteofibrosarcoma of lung*
Labrador[8]	F	11	Fibrosarcoma of lung*
Mixed-breed[7]	F	8	Malignant mixed-cell tumor of lung*
Dalmatian[4]	F	8	Chondrosarcoma of lung*
Boston Terrier[1]	F	14	Chondrosarcoma of lung*
Boxer[1]	M	8	Bronchogenic carcinoma*
Boxer[1]	M	9	Bronchogenic carcinoma*
Mixed-breed	M	11	Bronchiolar carcinoma*
Mixed-breed[1]	M	5	Pulmonary tuberculosis*
German Shepherd Dog[1]	M	7	Epidermoid carcinoma of tonsil**
Mixed-breed[1]	F	11	Malignant, mixed mammary tumor**
Mixed-breed[1]	F	4½	Osteosarcoma of thoracic esophagus**
Boxer[2]	M	8	Renal adenocarcinoma**
Springer Spaniel[6]	M	9	Hemangiosarcoma of thyroid region**
Mixed-breed	F	12	Malignant, mixed mammary tumor
Springer Spaniel[1]	F	11½	Mixed malignant tumor of mammae**
Fox Terrier[15]	M	5	Adenocarcinoma of liver
German Shepherd Dog[1]	M	7	Vegetative valvular endocarditis
Hound	M	4	Cor pulmonale with congestive pulmonary artery from heartworms

The superior numbers after the breed names refer to the references for this report. The three without reference numbers are those reported in this article.
*Primary lesions in lungs; **metastatic to the lungs.

the legs, there were typical subperiosteal elevations (Fig. 7 and 8). On the day prior to euthanasia, this dog had a severe convulsion.

At necropsy, there were multiple tumor masses varying in size from 2 mm. to 3 cm. in diameter. These masses were found in all lobes of the lungs, with a concentration of larger masses in the right diaphragmatic lobe. These infiltrations appeared grossly to be composed of 2 types of tissues. The larger and most numerous masses had an osseous consistency, and the smaller masses resembled lymphoid tissue. In the pancreas, 3 cm. from the pylorus and adherent to the duodenum, was a firm, round mass 1½ cm. in diameter. This mass appeared to be primary in the pancreas and gave a gross impression of infiltrating the duodenal wall. It resembled the osseous type of infiltration in the lungs. The articular surfaces of the joints were normal.

The histopathologic diagnosis of the lung lesion was soft tissue sarcoma, possibly metastatic, originating from a mixed-cell tumor of the mammary gland of the right axillary region. The mass in the pancreas was an islet cell carcinoma.

Dog 3.—This was a hound-type male, 4 years old and weighing 33 kg.** Stiffness when walking had become progressively more pronounced, and there was shortness of breath on exertion. This dog was slow on rising from a prone position to a standing one. Close examination was necessary to detect the slight swelling of the extremities. There was excessive drooling of thick saliva. A direct blood smear for *Dirofilaria immitis* was positive. On radiography of the thorax, lung or esophageal lesions were not found as expected. The heart appeared large with a prominence of the pulmonary conus (Fig. 9). On radiographic examination of the long bones of the legs, there was minimal subperiosteal proliferation (Fig. 10 and 11). A diagnosis of cor pulmonale associated with hypertrophic pulmonary osteoarthropathy was made.[11]

The diagnosis was based on the finding of large numbers of filariae in a direct blood smear and the prominence of the pulmonary conus. It was presumed that the prominence of the conus was due to a large embolus of adult heartworms. The blood count was as follows: erythrocytes 5,090,-

Fig. 2—Radiograph of radius, ulna, and humerus of dog 1. The subperiosteal elevations are denoted by arrows.

Fig. 3—Radiograph of femur, tibia, and fibula of dog 1. The subperiosteal elevations are denoted by arrows.

**Referred by R. R. Gibbs, D.V.M., New Orleans, La.

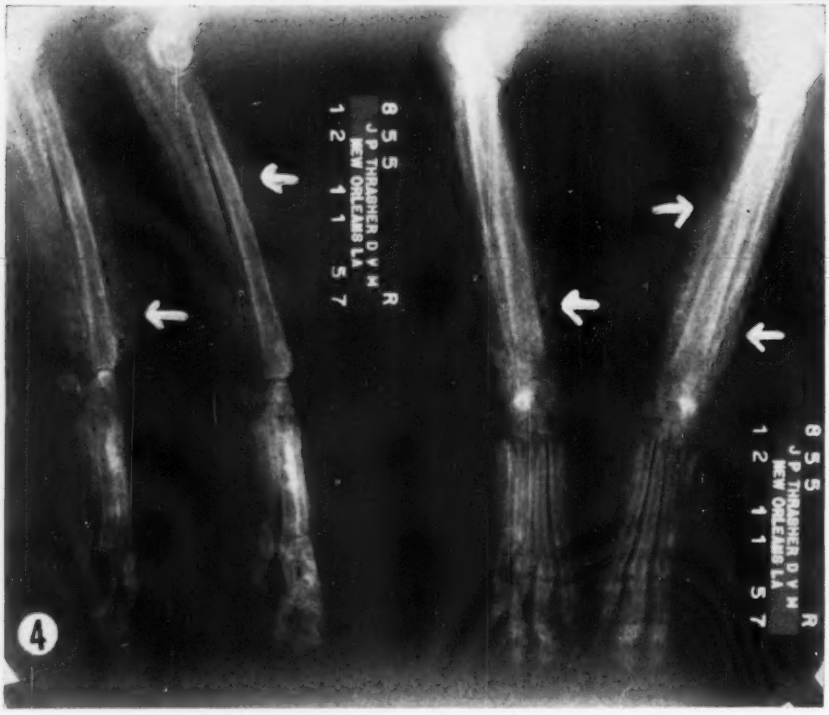

Fig. 4—Radiographs of the radius and ulna of dog 1 at necropsy. In comparison with Figure 2, there are radical hypertrophic changes, which occurred in 4 months.

Fig. 5—Radiographs of the tibia and fibula of dog 1 at necropsy. In comparison with Figure 3, there are radical hypertrophic changes, which occurred in 4 months.

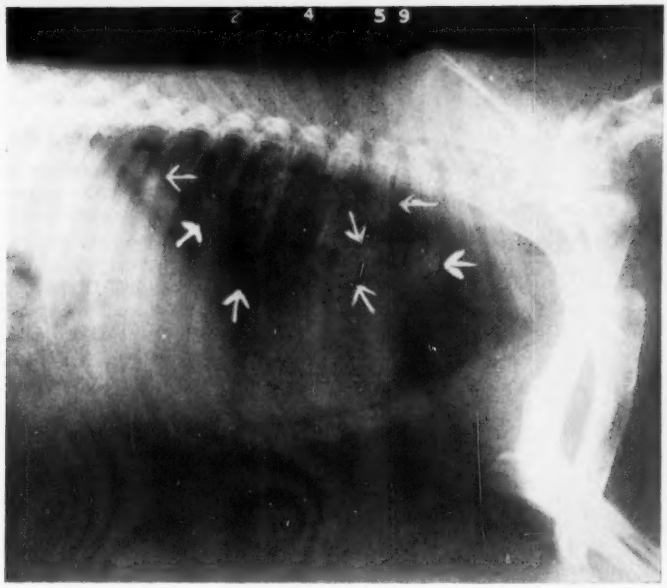

Fig. 6—Lateral radiograph of thorax of dog 2. Multiple dense masses (arrows) are visible throughout the entire lungs.

000; hemoglobin 12.8 Gm./100 ml.; leukocytes 12,595; lymphocytes 18%; monocytes 5%; neutrophiles 70%; and eosinophiles 7%. The blood urea ntirogen was 8.1 mg./100 ml., which might indicate some liver damage.

Since the hypertrophic changes of the leg bones are considered reversible when the pulmonary obstruction is removed,[6,7] we were given permission to operate on an experimental basis.

This dog was considered a poor surgical risk at the time of admission, due to his debilitated condition. He was allowed complete rest and given extra feedings of a commercial meal supplemented with a vitamin-mineral product. In radiographs of the thorax taken at weekly intervals, lung neoplasia still was not found.

A pulmonary arteriotomy was performed successfully Sept. 2, 1960, and 62 adult *D. immitis* were removed. These worms measured 27 to 30 cm. in length. Recovery was uncomplicated and the stiff gait grad-

Fig 7—Radiograph of the radius and ulna of dog 2. Arrows denote hypertrophic changes.

Fig. 8—Radiograph of femur, tibia, and fibula of dog 2. Arrows denote hypertrophic changes.

Fig. 9—Dorsoventral radiograph of thorax of dog 3. The arrow denotes the prominence of the pulmonary conus.

ually disappeared. Excessive salivation ceased, and there was a gradual increase in weight. This dog was held under hospital observation until Nov. 25, 1960. In radiographs of the long bones of the legs at that time, there were no hypertrophic changes.

At the time of this report, the dog has maintained normal weight and appears in good health. He continues to hunt and has no evidence of dyspnea.

Discussion

There have been several theories advanced relating to the cause of hypertrophic changes of bones when chronic pulmonary congestion is present. Factors such as anoxia, toxins, increased peripheral circulation,[5,9,13] congenital heart disease, pulmonary tuberculosis,[1,5,13] cirrhosis of the liver,[3] and primary and metastatic lung neoplasms[1,2,4,6-8,10,12] have been associated with hypertrophic pulmonary osteoarthropathy.

The 2 theories that appear most acceptable at present are chronic anoxia and obscure toxins.[13] It is my opinion that both theories have merit but neither, as a single entity, explains the hypertrophic changes of the bones.

The majority of investigators favor the theory of anoxic anoxia, a condition of reduced oxygen tension in the blood.[5] This was established experimentally for a chronic heart disease study and produced accidentally 1 case of hypertrophic pulmonary osteoarthropathy out of a total of 4 attempted.[9] The experiment consisted of shunting the blood from the pulmonary ar-

Fig. 10—Radiograph of radius and ulna of dog 3. There are minimal subperiosteal hypertrophic changes (arrows).

tery through an anastomosis to the left auricle. This allowed improperly or unoxygenated blood to return to the general blood vascular system of the body. The single animal with hypertrophic changes of the long bones survived for 8 months.

Several investigators have attempted to correlate the blood calcium and phosphorus ratio with anoxia as responsible for the excessive subperiosteal elevations.[2,6,8] This line of thinking has not been definitive to date. This may be due to too few cases and the lack of standardization of diet fed to privately owned pets.

If anoxia, produced by lung destruction, is responsible for hypertrophic changes of the long bones, it would seem that a pneumonectomy would produce the same result. Pneumonectomy has been used in treating lung cancer associated with hypertrophic changes of the bone in a dog, and there was evidence of regression of the hypertrophy.[1]

Many investigators believe some obscure toxins are responsible for the hypertrophic changes in the bones.[13] These toxins may be from tissue destruction of an invading neoplasm, a parasite, or from unknown sources. However, this theory is not tenable since 2 histopathologically identical neoplasms may be found in 2 individuals. In one case, hypertrophic osteoarthropathy may develop whereas, in the other case, it may not in spite of greater lung tissue destruction. The latter may survive longer.

Further investigation is necessary to determine the cause of hypertrophic osteoarthropathy.

Some investigators consider hypertrophic osteoarthropathy uncommon in dogs[12] and most frequent in larger breeds of dogs, especially those used for hunting.[5] Three factors that may account for its rarity are (1) failure of practitioners to report cases, (2) inaccurate diagnosis, and (3) the socioeconomic standard of the owners of the larger, hunting breeds of dogs.

Summary

In a study of 3 cases of hypertrophic pulmonary osteoarthropathy in dogs, one was associated with a primary lung neoplasm, one with a metastatic neoplasm originating in the mammary gland, and in the 3rd there was cor pulmonale associated with hypertrophic osteoarthropathy of the

Fig. 11—Radiograph of the tibia and fibula of dog 3. There are minimal subperiosteal hypertrophic changes (arrows). The 2 lead pellets (upper right) are not relevant.

long bones of the legs; the condition was reversed upon removal of the adult *Dirofilaria immitis* by a pulmonary arteriotomy.[1]

An analysis of 18 cases published in the *J.A.V.M.A.* during 18 years and other cases reported in the references did not reveal a characteristic pattern for hypertrophic pulmonary osteoarthropathy.

The disease occurred with equal frequency in both sexes. Age did not seem significant. The primary lung condition outnumbered the metastatic lesions 11 to 7.

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Respiratory Stimulation of Newborn Pups

RECENTLY, I have used thiamylal sodium (Surital Sodium, Parke-Davis) intravenously as an anesthetic for bitches on which cesarean operations are to be performed. This anesthetic agent crosses the placenta and enters the circulation of unborn pups, causing sedation in them, so that a pup when removed from the uterus is sluggish and its respiration is depressed.

To counteract this depression, my assistant rubs the pup vigorously, and I inject 5 to 10 mg. of an anesthetic antagonist, 3,3-methylethyl glutarimide (Mikedimide, Parlam Corp.), into the umbilical vein of the pup. In 5 to 10 seconds, respiration and color of the pups become normal without untoward side effects. I have used this technique in 3 cesarean operations involving 22 pups without any losses. The oldest litter is now 3 months old; the youngest, 21 days. All are developing normally.—*R. F. Wester, D.V.M., Syracuse, N.Y.*

Effect of *Leptospira pomona* on the Reproductive Efficiency of Cattle

D. R. Lingard, D.V.M., M.S., and L. E. Hanson, D.V.M., Ph.D.

VETERINARIANS as well as laymen have suspected bovine leptospirosis as a cause of decreased reproductive efficiency, apart from obvious losses due to abortion.[3] The purpose of this study was to correlate the reproductive efficiency of 12 herds of cattle with the incidence of *Leptospira pomona* infection as indicated by antibody titers in the blood serum.

Materials and Methods

The presence or absence of *L. pomona* infection in the cattle of 12 institutional herds was ascertained by annual serologic surveys, employing the *Leptospira* agglutination-lysis test.[4] Reactions at titers of 1:100 or more were considered positive.

The reproductive efficiency of the herds was calculated using the Kingman method,[2] as quoted below:

> The method of arriving at the reproductive efficiency of the herd is based upon the assumption that when a cow has nine months of normal pregnancy during a twelve-month period, she should be given a rating of 100 per cent. This is called "par". This standard of measurement appears to be the one that best fits the problem.
>
> It is fundamental that the calculation must be centered upon the months of normal pregnancy (M). The period of gestation of the cow is nine months. If the total number of months of normal pregnancy is divided by nine, the result will represent the normal calf equivalent (Cq), *i.e.*, M/9 = Cq.
>
> The next step is to obtain the number of cow-years (Cr). A cow-year, the basis of calculation, is twelve months. When, however, a cow is in the herd for nine months or more she is considered to be in the twelve-month class. The cow-year cannot start with the date of service and end with any chosen time of observation. It must be a multiple of twelve, not a fraction of twelve.
>
> The reproductive efficiency (R) is determined by dividing the normal calf equivalent (Cq) by the cow-years (Cr) and multiplying by 100, *i.e.*, Cq/Cr x 100 = R.
>
> Confusion may arise in using this method of calculation because of the attempt to introduce into the formula closely related but extraneous factors, such as number of services, unproductive eligible months, and rest periods. The fact that three months of "leeway" is given out of every twelve months, allows such problems to enter the picture without changing the fundamental premise. Therefore, in making the calculation upon the nine month-twelve month basis, one must ignore all related factors and confine the interpretation to the premise stated.

The percentage of reactors (titer of 1:100 or more) to *L. pomona*, using the agglutination-lysis test, was computed for each herd for each year of a 3- to 5-year period. Only cows in the breeding herd for 9 months or more of the 12-month period were considered members of the herd for that year.

The reproductive efficiency of each herd was calculated for each year of the observation period. Comparisons were made between the reproductive efficiency of herds free from *L. pomona* infection and of herds in which titers of 1:100 or greater were found. Intraherd comparisons of reproductive efficiency and the percentage of *L. pomona*-positive cattle were made on a yearly basis.

Results and Discussion

The calculated reproductive efficiency and percentage of significant titers (1:100 or more) for *L. pomona* for each herd is given (Tables 1 and 2).

The average reproductive efficiency of 2,088 cows free from *L. pomona* in 4 herds over an 18-herd-year period was 75.6% with a range of 62.3 to 81.7%. The standard deviation was 5.6%. During a 38-herd-year period, 5,113 cows in 8 *L. pomona*-positive herds had an average of reproduc-

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tive efficiency of 71.9% with a range of 48.4 to 84.7%. Efficiency values for 32 (84.2%) of the herd-years fell within ± 2 standard deviations of the average reproductive efficiency of the controls. These findings suggest that the presence of leptospirosis, as reflected by positive titers for *L. pomona*, had no significant effect upon the reproductive efficiency of the cattle.

An appraisal of the year-to-year efficiency of cows within a herd, when plotted against the percentage of *L. pomona* titers in the herd, reveals no definite correlation

TABLE 1—Reproductive Efficiency of 4 *L. pomona*-Free Herds of Cattle

Herd	Year	No. of cows	Reproductive efficiency (%)	L. pomona-pos. (%)
A	1954	135	77.4	0
	1955	127	80.0	0
	1956	137	81.3	0
B	1954	126	75.7	0
	1955	159	62.3	0
	1956	174	74.0	0
	1957	160	64.7	0
	1958	151	71.2	0
C	1954	109	80.0	0
	1955	98	75.6	0
	1956	103	80.7	0
	1957	99	79.0	0
	1958	103	70.7	0
D	1954	75	81.2	0
	1955	76	78.9	0
	1956	99	81.7	0
	1957	79	73.4	0
	1958	78	72.5	0

Total herd-years — 18; total cows — 2,088; av. L. pomona-positive — 0%; av. of reproductive efficiency — 75.6%; range of reproductive efficiency — 62.3-81.7%; standard deviation — 5.6%.

TABLE 2—Reproductive Efficiency of 8 *L. pomona*-Positive Herds of Cattle

Herd	Year	No. of Cows	Reproductive efficiency (%)	L. pomona-positive (%)
E	1953	340	74.6	25.3
	1954	321	62.7	6.2
	1955	333	78.4	59.8
	1956	358	83.9	50.4
	1957	349	74.3	30.9
F	1954	90	83.7	0
	1955	99	74.7	0
	1956	92	57.6	0
	1957	96	69.9	32.1
	1958	100	72.0	31.0
G	1954	108	63.4	0
	1955	107	55.0	0.9
	1956	104	48.9	4.8
	1957	85	48.4	0
H	1954	109	79.1	1.8
	1955	130	71.6	2.3
	1956	128	68.4	1.6
	1957	102	64.9	68.6
	1958	94	74.6	62.8
I	1954	82	84.7	0
	1955	100	73.8	3.0
	1956	90	77.9	1.1
	1957	96	79.5	0
J	1954	84	74.6	1.2
	1955	98	79.7	1.0
	1956	106	70.9	0
	1957	105	68.6	59.0
	1958	108	76.2	97.6
K	1954	83	71.8	2.4
	1955	94	66.4	2.1
	1956	86	69.7	8.1
	1957	89	67.3	2.2
	1958	81	79.6	61.7
L	1954	130	78.5	13.1
	1955	136	76.3	14.7
	1956	141	81.3	8.5
	1957	129	76.4	5.4
	1958	130	74.2	3.1

Total herd-years — 38; total cows — 5,113; av. L. pomona-positive — 18.0%; av. reproductive efficiency — 71.9%; range of reproductive efficiency — 48.4-84.7%; standard deviation — 8.7%.

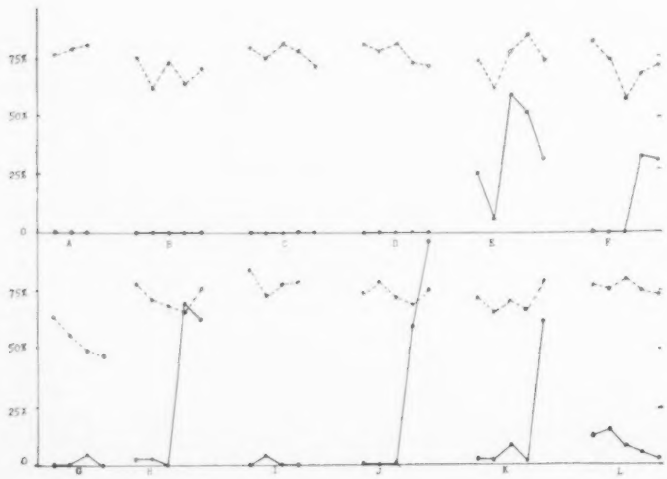

Fig. 1—A graphic comparison of the intraherd relationship of reproductive efficiency (broken line) to the percentage of *L. pomona* reaction (solid line) in the herd for the year (circles represent consecutive years from 1954). Notice the overall lack of correlation between the 2 factors.

(Fig. 1). This too would suggest that leptospirosis due to *L. pomona* is not responsible for a decrease in reproductive efficiency of cattle.

Summary

A statistical study was made of the persisting effects of *Leptospira pomona* infection upon the reproductive efficiency of cattle in 12 herds over a 56-herd-year period.

Four leptospirosis-free herds, composed of 2,088 cows, had an average reproductive efficiency of 75.6%, with a range of 62.3 to 81.7%, during an 18-herd-year period. Eight herds composed of 5,113 cows had an average reproductive efficiency of 71.9%, with a range of 48.4 to 84.7%, over a 38-herd-year period. The percentage of cows in these herds with titers to *L. pomona* ranged from 0 to 97.6%, with an average of 18.0%.

Values of 32 (84.2%) of the herd-years fell within ± 2 standard deviations of the average reproductive efficiency of the controls.

Both interherd and intraherd comparisons made in this study suggest that *L. pomona* did not significantly affect the reproductive efficiency of cows.

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Surgical Treatment of Hip-Joint Diseases

In a five-year period, 7 of 66 dogs with hip lameness did not respond favorably to nonoperative or orthodox treatment. There were 2 dogs with aseptic necrosis of the femoral head and neck; and 1 each with traumatic luxation, traumatic fracture of the femoral head and neck, arthritis, fracture of the acetabulum, and bilateral hip dysplasia.

Treated by means of excision arthroplasty, 5 of the 7 dogs subsequently regained sound use of the limbs; the results in one dog were regarded as partially successful because the final results were not known; treatment in 1 dog was unsuccessful.

The surgical procedure involved the "anterior" approach to the hip joint and proximal end of the femur. The femoral head was removed by cutting through the neck transversely, leaving no sharp spicules or fragments attached to the stump or in the wound. The wound was closed in the usual manner but no attempt was made to close the joint capsule.—*Vet. Rec. (June 10, 1961): 573.*

• • •

Five dogs treated surgically for hip diseases responded favorably, with either virtual disappearance of lameness or with full use of the limbs. In 2, a "dorsal" approach, giving access to the dorsal rim of the acetabulum, was used because the dogs were heavily built. The diagnosis was bilateral hip dysplasia in both instances. Other conditions treated similarly with consistently good results were: deformity, rarefaction, and disintegration of the femoral head; and persistent luxation of the femoral head.—*Vet. Rec. (June 10, 1961): 576.*

Comparison of *Leptospira pomona* Bacterin and Attenuated Live Culture Vaccine for Control of Abortion in Cattle

S. G. Kenzy, D.V.M., Ph.D.; R. W. H. Gillespie, Ph.D.; and John H. Lee, D.V.M.

OUR STUDIES with an attenuated live-culture vaccine in cattle indicated that demonstrable antibodies (agglutinins) appeared by postvaccination day 4. By contrast, 12 to 14 days or more may elapse after administration of bacterins before agglutinins are demonstrable.[6,7] The antibody level is also much higher in cattle given live-culture vaccine than in those given bacterin.[6,7]

Failure of *Leptospira pomona* bacterins to stop leptospirosis "abortion storms" effectively in some herds has been observed.[8,9,11,12] Usually, abortion storms cease within 7 to 10 days after bacterins are given; however, the producers of *L. pomona* bacterins indicate that the product may not become effective for several weeks to a month. Abortions have been reported from 19 to 47 days after experimental exposure; thus, further abortions may be expected after vaccination with bacterins.[3,7,10]

This report concerns the comparative evaluation of *L. pomona* commercial bacterin and an experimental live-culture vaccine in controlling an abortion storm caused by *L. pomona*.

History

Within 3 days, there were 6 abortions in a grade herd of 156 breeding Herefords. Clinical diagnosis of leptospirosis was confirmed through agglutination-lysis (AL) tests on serum samples from 3 of these cows. Leptospires were detected by microscopic examination of urine specimens from 3 of 6 cows that aborted and were identified as *L. pomona* through serologic tests involving guinea pigs inoculated with infective cow urine.

Serologic tests were negative for brucellosis and vibriosis. About 3 to 5% of the cows appeared abnormally inactive, and several had elevated body temperatures.

This herd was being wintered in pastures drained by a creek which flowed through several other pastures and farmyards. On the basis of serologic evidence, leptospirosis was reported in an upstream herd. Since the December weather was mild and waterpools were plentiful in feeding areas, conditions appeared favorable for transmission of leptospirosis. General condition of the herd was good.

Within 4 hours after the laboratory had confirmed the clinical diagnosis of leptospirosis, the cows were vaccinated with either *L. pomona* commercial bacterin or an attenuated live-culture vaccine.* Cattle given bacterin were placed in a separate pasture from those given live vaccine. The owner examined each herd twice daily for aborted fetuses, which were collected, identified, and delivered to this laboratory for necropsy and cultural studies.

Results

Further abortions occurred during the postvaccination period, beginning on postvaccination day 22 and continuing through day 30 (Table 1). A total of 17 abortions occurred in the group of 75 cows which were given bacterin, whereas only 6 cows given the attenuated live-culture vaccine aborted. All fetuses were approximately 6 months old.

No pathogens were found through cul-

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*This strain of L. pomona had been maintained through about 500 passages in eggs when received from Dr. Charles York, Pitman-Moore Co., Indianapolis, Ind. Our laboratory carried out 42 further passages before use as a vaccine in this study.

tural studies of the 17 fetuses submitted. Inoculation of fetal tissues into guinea pigs did not prove presence of infective leptospires, although Wharthin-Wherry stains** of fetal organs indicated *Leptospira*-like organisms were present in liver tissues. When stained with hematoxylin and eosin, there were necrotic changes evident in the hepatic cells, although livers were grossly normal. Gas pockets were observed in the tissues of a few aborted fetuses. The 6th aborted fetus, from a cow vaccinated 30 days earlier with the live-culture vaccine, was soft because of extensive degenerative changes.

On necropsy of 17 fetuses, extensive quantities of hemoglobin-stained fluids were found in the thoracic and peritoneal cavities and diffuse, reddish-stained areas were seen subcutaneously.

Fetal extracts inoculated into bovine kidney tissue cultures did not yield cytopathic viruses.†

Retained fetal membranes, observed in over half of the cows that aborted, appeared responsible for a toxemia which was of sufficient severity to kill 2 cows although treatment was given them. Three cows that aborted and several of the clinically ill cows that did not abort had hemoglobinuria.

TABLE 1—Abortions and Deaths in Cattle After Vaccination for Leptospirosis

Days post-vaccination	With attenuated live-culture vaccine		With bacterin	
	No. of abortions	Adult deaths	No. of abortions	Adult deaths
0-21	..	..	..	..
22	3	..	..	..
23	..	..	1	..
24	..	1	..	..
25	2	..	1	..
26	..	..	2	..
27	..	..	2	1
28	..	..	5	..
29	..	..	3	..
30	1	..	3	..
31	..	..	..	..
32	..	..	..	..
33	..	..	..	..
34	..	..	..	..
35	..	..	..	..
Totals	6	1	17	1

Discussion

Our failure to culture viable *L. pomona* from aborted bovine fetuses confirms our earlier observations and those of other investigators.[3,10,14,15] However, successful cultural isolations of *L. pomona* from fetuses have been reported.[1,13] Apparently, the fetus remains in the uterus for some time after death. As a result, degenerative changes destroy the viability and infectivity of *L. pomona*. *Leptospira*-like structures may still be identified by microscopic study of tissue sections.

Recurrence of abortions about 3 weeks after the 1st abortion storm presents an interesting pattern. It would appear that these aborting cows were infected before the time of vaccination. By postvaccination day 25, the group given attenuated live culture had 2 more abortions, whereas the group given bacterin had their heaviest loss a week later. Such a period of delay corresponds approximately to the difference in time required for antibodies to become demonstrable in cows vaccinated with attenuated live-culture and killed-virus vaccines. This difference in time required for demonstration of antibodies may then account for the apparent superiority of the attenuated live-culture vaccine over the bacterin in controlling abortions.

Our earlier studies indicated that cows given attenuated live-culture vaccine did not excrete demonstrable antibodies in the urine. Thus, since all urine tested from aborting cows in this herd contained agglutination-lysis antibodies, we believe that the abortions were due to a virulent *L. pomona* and not to the attenuated live culture.

The early cessation of abortions usually observed by practitioners within a week or 10 days after vaccination may suggest that only a limited number of cattle were already infected or that most of the herd had already become infected and that this incident was characterized by a limited number of abortions. To explain the marked differences in abortion rates in different unvaccinated herds is difficult. Such factors as nutrition, weather changes, prevalence of surface waters, general management, virulence of the infecting strain, and amount of exposure must be considered. Our lack of knowledge concerning the pathogenesis of leptospiral abortion severely handicaps the interpretation of these predisposing factors.

**Straining techniques and section examinations by Dr. C. H. Bridges, associate professor of veterinary pathology, College Station, Texas, who has modified this stain for leptospiral studies.

†Studies were carried out through courtesy of Dr. T. Moll, virologist, Department of Veterinary Microbiology, Washington State University, Pullman.

Since abortions occurred in this herd before vaccination, the disease must have been present for approximately 3 weeks. In view of the poor drainage in the pasture and mild weather, circumstances appeared to be favorable for the survival of leptospires and spread of infection.[4,5]

Summary

Abortions associated with *Leptospira pomona* in a herd of breeding Herefords continued for 30 days after vaccination. Seventeen abortions were observed in 75 cows after vaccination with a commercial *L. pomona* bacterin; 6 abortions occurred in a similar number of cows vaccinated with an attenuated live-culture vaccine. *Leptospira pomona* was isolated by inoculating urine from cows which aborted into guinea pigs. *Leptospira pomona* could not be cultured from fetal tissues or demonstrated by inoculating such tissues into guinea pigs. Silver stains of fetal liver sections, however, indicated that *Leptospira*-like organisms were present.

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Diethylstilbestrol Predisposes Mink to Urinary Infection

About 5 years ago, there was a sudden and unexplained increase in urinary tract infection and bladder stones in male mink on fur farms in Wisconsin. Trouble started when mink ate livestock feeds or chicken scraps and heads containing diethylstilbestrol, which caused changes in urinary tract tissues and predisposed them to bacterial infections.

Urinary tract infection was gradually reduced when diethylstilbestrol-containing livestock feeds and poultry and poultry byproducts were eliminated as mink feed.—*Univ. of Wisconsin News Release, Madison, Wis., Nov. 25, 1960.*

Persistence of *Leptospira pomona* in Porcine Tissues

S. D. Sleight, D.V.M., M.S., and A. M. Lundberg, M.S.

LEPTOSPIRA POMONA infection is often characterized by meningitis of varying severity in both man[4,7,14] and animals.[11,15] Brain lesions have been described in man,[8] goats,[12] cattle,[6] sheep,[10] and swine.[16] According to earlier experimental evidence, isolations of *L. pomona* from porcine brain tissue could be made from the 6th to the 8th day after experimental infection.[16]

Spleen and liver lesions are usually few and of limited extent in *L. pomona* infection in swine.[9,16] Organisms were not isolated after postinfection day 8 in previous work. The affinity of *L. pomona* for kidney tissue is well known, and the lesions have been amply described.[3,9,10,12,16]

The present work was undertaken to determine the persistence of leptospires in porcine brain tissue and to correlate it with the presence of leptospires in blood, liver, spleen, and kidneys. The interrelationships of the period of leptospiremia, the appearance of circulating antibodies, and the presence of leptospires in various tissues were also studied.

Methods

Eighteen crossbred pigs 2 months old were used as experimental animals. Fifteen pigs were given 2 ml. of guinea pig blood infected with *L. pomona*. The 3 remaining pigs were given 2 ml. of uninfected guinea pig blood and served as controls. An infected pig was killed each day from postinfection (PI) days 4 to 14, and one of the remaining 4 pigs was killed on each of PI days 18, 26, 35, and 45. Control pigs were killed on days 6, 9, and 15.

All serologic studies were performed by the modified microscopic agglutination-lysis test using *L. pomona* (strain Johnson) live antigen.[11] Serum samples were obtained daily from each infected pig from days 4 through 14. At death, blood samples were collected from control pigs and from all pigs killed after the PI day 14.

On PI days 2 through 14, approximately 0.1 ml. of blood from each infected pig was inoculated into each of 3 tubes of Stuart's medium* with 10% rabbit serum. The cultures were incubated at 30 C. and examined for the presence of leptospires by darkfield microscopy on PI days 14 and 28.

From each infected pig, samples of both kidneys, liver, spleen, and brain were obtained at necropsy for guinea pig inoculation. Tissues were homogenized in 0.85% sterile sodium chloride solution to make approximately a 10% tissue suspension. Each of 3 weanling guinea pigs were inoculated with 2 ml. of kidney suspension, 2 each with 2 ml. of liver and spleen suspension, and 2 each with 2 ml. of brain suspension for each pig killed. Two guinea pigs were inoculated with similar amounts of kidney suspension from each control pig. The original inoculum was considered to have contained leptospires if the serum of the guinea pigs contained antibody for *L. pomona* at a dilution of 10^2 or higher 3 to 4 weeks after inoculation. Presence of leptospires in brain tissue from pigs killed on days 10, 11, 12, 14, and 18 was further confirmed by blood culture isolation from guinea pigs.

Results

Leptospires were isolated from blood cultures inoculated as early as PI day 2 and as late as day 10. The duration of demonstrable leptospiremia in individual pigs ranged from 1 to 8 days.

Leptospires were demonstrated in kidneys of infected pigs from day 4 until the experiment was concluded, in the liver or spleen, or both, from day 4 through day 10, and in the brain from day 6 through 18 with the exception of day 13. No isolations were made from brain tissue of pigs killed on days 26, 35, and 45.

Significant serum titers appeared first on day 9. The maximal agglutination-lysis

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*Difco Laboratories, Detroit, Mich.

reactions occurred in serum dilutions ranging from 10^3 to 10^8.

Discussion

Results of the present experiment indicate that *L. pomona* persists in the brain for a sufficient length of time to produce an inflammation responsible for the clinical signs of meningitis. The nature of the response is similar in the brain and kidneys, lymphocytic infiltrations being characteristic.[6,8,10,16] Although the relative persistence of leptospires in the brain is shorter than in the kidneys, the presence in the brain for at least 13 days indicates that for some reason the total defense mechanism in brain as well as kidneys is insufficient to kill leptospires during the early course of the disease. Isolations from brain and kidneys were made from pigs whose serum antibody titers ranged from 10^3 to 10^6 when tested with *L. pomona* antigen.

Leptospires appear to be present in liver and spleen concurrently with leptospiremia, and they disappear from these organs soon after the appearance of detectable circulating antibodies. In earlier experiments, the authors observed no detectable hepatic or splenic lesions in experimental *L. pomona* infection in swine. Other workers have reported hepatic necrosis and splenic congestion in cattle and sheep infected with *L. pomona*.[5,17,18] Such lesions, when present, are due probably to a hemolytic anemia induced by the production by *L. pomona* of a hemolytic agent capable of lysing erythrocytes of ruminants.[1,2] Thus, it is postulated that the hepatic and splenic lesions in cattle and sheep are not due to an inflammatory response occasioned by the presence of the organism but are secondary effects of blood cell destruction and resulting poor oxygenation.

The period of leptospiremia and the results of serologic findings are in accord with previous experimental evidence.[3,13,16] relationship between the appearance of circulating antibodies and the disappearance of organisms from blood, liver, and spleen, but this relationship does not apply to kidneys and brain.

Summary

Leptospira pomona was isolated from porcine brain tissue as long as 18 days after experimental inoculation. *Leptospira* isolations from spleen, liver, and blood could be made only until postinoculation (PI) day 10. Leptospires were present in the kidneys from PI day 4 until the experiment was terminated. There seems to be a definite

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Effects of Intramuscular Injections of Iron-Dextran in Newborn Lambs and Calves

Roy H. Carlson, D.V.M.; Melvin J. Swenson, D.V.M., Ph.D.; Gerald M. Ward, Ph.D.; Nicholas H. Booth, D.V.M., Ph.D.

IN RECENT YEARS iron-dextran has been used extensively in the prevention of postnatal anemia in pigs. Most investigators have obtained either a growth or hematologic response in pigs by injecting iron-dextran intramuscularly.[2,3,5,14,20,23,25,30] A greater response is obtained from the injected iron when pigs are raised on concrete floors. Injectable iron-dextran was of no benefit in specific pathogen-free (SPF) pigs when compared with control pigs given no supplemental iron; pigs with a known disease history responded more favorably to injectable iron-dextran than to oral treatments.[6]

Oral iron has been effective in alleviating subclinical anemia in calves during the postnatal period.[22,24] In most calves fed control rations (without added iron), hemoglobin (Hb.) concentrations and packed cell volumes (PCV) either had returned to or were close to the values observed in adult cattle, by the time the calves were 10 weeks old.

The paucity of hematologic data from ruminants, especially sheep, after iron therapy led to the investigation reported herein. In 1956 and early 1957, a project was designed in which iron-dextran was injected intramuscularly into newborn calves and lambs and its effects on weight and hematologic values were determined on treated and control animals.

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This project was supported, in part, by a grant-in-aid from the Armour Laboratories, Chicago, Ill.

This report has been approved for publication by Colorado State University and by the Graduate School as scientific series No. 671.

Experimental Procedure

Ninety-seven native Hampshire crossbred lambs were allotted at random to 2 groups (46 treated and 51 controls). The lambs were from a band of ewes fed a good quality alfalfa hay and corn silage ration. They were held in pens 50 by 150 feet. Cover was provided in each pen by a shed open to the south side. The lambs were weighed within 48 hours after birth and in all cases had nursed the ewes. At this time, a blood sample was taken from the jugular vein for PCV and Hb. determinations. Intramuscularly, 3 ml. of iron-dextran* containing 150 mg. of elemental iron was injected. The injection was made in the thickest portion of skeletal muscles on the posterior side of the right hindleg. The lambs were weighed and blood samples were taken when lambs were 1, 2, 3 4, 6, 8, and 12 weeks old.

The anticoagulant for collecting blood samples was a mixture of ammonium and potassium oxalate.[8] Packed cell volume of each was determined with Wintrobe hematocrit tubes. Samples were centrifuged for 30 minutes at 3,000 r.p.m. The acid hematin method[7] was used in the Hb. determinations. A Hb. standard was prepared by determining the iron content of a quantity of blood by the Wong method.[29] A curve was then established by diluting the Hb. standard to 4 known concentrations and making readings on a Beckman B spectrophotometer. The latter instrument was used for all Hb. readings. The data were subjected to statistical analyses by the Student's "t" test.

Twelve newborn heifer calves from the Colorado State University dairy herd were allotted at random to two groups. Six calves from one group served as controls, and calves in the other group were given iron-dextran by intramuscular injection at the rate of 24 ml. (1,200 mg. of elemental iron) per 100 lb. of body weight. The entire quantity was given at one location. It was injected in the skeletal muscles on the posterior side of the right hindleg. The calves were weighed at birth and when 4, 10, and 24 weeks old. Blood samples were taken from the jugular vein within 24 hours after birth. The calves had nursed the cows before blood samples were taken. Subsequent samples of blood were taken when calves were

*Armidexan, Armour & Company, Chicago, Ill.

TABLE 1—Average Weights, PCV, and Hemoglobin Values with Standard Deviations of 46 Treated (Iron-Dextran) and 51 Control Lambs

Age	Weight (lb.)	PCV (%)	Hemoglobin (Gm./100 ml.)
2 days or less			
Treated	13.5±2.7	42.3±5.2	13.5±1.9
Control	13.6±2.6	41.9±5.5	13.6±1.6
1 week			
Treated	17.2±5.3	44.2±3.3**	14.1±1.2**
Control	17.6±3.3	40.3±3.9	13.1±1.5
2 weeks			
Treated	22.1±4.1	43.1±2.9**	13.4±1.6**
Control	21.2±3.5	40.1±3.4	12.7±1.3
3 weeks			
Treated	26.1±4.7	42.1±3.2**	13.2±1.9
Control	24.6±3.8	39.1±4.1	12.6±1.6
4 weeks			
Treated	29.3±5.5	40.9±1.1**	13.5±1.1*
Control	27.4±4.2	39.3±2.3	13.0±1.0
6 weeks			
Treated	34.7±6.9	40.4±2.3	13.9±1.8
Control	32.4±5.6	39.4±2.7	13.7±1.1
8 weeks			
Treated	41.2±8.0*	39.7±2.5	13.4±1.1
Control	37.7±5.7	39.3±2.4	13.3±1.0
12 weeks			
Treated	52.5±9.8**	38.9±2.5	14.1±0.2
Control	47.4±7.3	38.8±2.3	14.1±0.2

*Significant at 5% level; **significant at 1% level.

1, 2, 3, 4, 6, 8, 12, 18, and 24 weeks old. The calves were given a ration of milk which was fed at 10% of body weight until they were about 3 months old. Hay was offered ad libitum at all times. Grain mix was offered until 5 lb. each per day was consumed. Calves were kept in a barn for 4 weeks; afterward, they were kept in drylot with shelter available.

Hemoglobin values and PCV were obtained as described. Total erythrocyte and leukocyte counts were made by standard methods of counting using a hemacytometer. The mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH), and mean corpuscular hemoglobin concentration (MCHC) were calculated.

Results and Discussion

The weight differences between the 2 groups of lambs indicated a progressive increase in favor of those given 150 mg. of iron in the form of iron-dextran (Table 1). At the 3rd week, the average difference of 1.5 lb. was significant at the 10% level of probability. At 8 weeks, the difference of 3.5 lb. was significant at the 2% level. The 12 weeks' difference of 5.1 lb. in favor of the treated lambs was significant at the 1% level. In 12 weeks, the lambs given iron-dextran had gained 10.8% more in body weight than the untreated controls.

When lambs were 1, 2, 3, and 4 weeks old (Table 1), the PCV of lambs given iron-dextran was significantly greater at the 1% level of probability. These differences decreased with age. When 6 weeks old, the average difference of 1.0% was significant at the 10% level; when 8 and 12 weeks old, the differences were not statistically significant.

The Hb. levels followed a pattern similar to the PCV (Table 1). When lambs were 1 and 2 weeks old, treatment effects were present at the 1% level of significance. The difference of 0.6 Gm. when 3 weeks old was significant at the 10% level. However, the difference of 0.5 Gm. when 4 weeks old was significant at the 5% level. The standard deviations were smaller when lambs were 4 weeks old than when 3 weeks old, which accounted for the greater significance of the differences at this age. This smaller standard deviation was also present in the PCV when lambs were 4 weeks old. There was no effect on Hb. levels following iron-dextran treatment of lambs 6, 8, and 12 weeks old.

After the early hematologic responses, there was a stimulation in growth. This finding does not mean that a stimulation of growth must be preceded by a hematologic response. In fact, hematologic responses are not always followed by a growth response. The Hb. levels and PCV of untreated lambs were not as low as some previously reported values for normal lambs. The average PCV of sheep has been reported at 32% with a range of 22 to 40.[1] The average value for Hb. was 12.6 Gm. with a range of 10.0 to 15.5. The lowest average PCV was 38.8%, and the lowest average Hb. was 12.6 Gm. (Table 1).

The average Hb. level of 40 normal sheep was found to be 11.2 Gm., and the average PCV for 100 normal sheep was 29%.[21] Seasonal variation has been reported[9] in Hb. levels of sheep, the lowest values occurring in February and March. The mean values for the 4 seasons ranged from 9.6 to 11.7 Gm./100 ml. of blood. On examination of blood of normal sheep, it was found in one study that PCV varied from 26 to 38%. In studying anemia of sheep, Hb. values of 7 to 9 Gm. in mild anemia and 5 to 7 Gm. in moderate anemia were reported.[10] The PCV in mild anemia was 17 to 23% and, in moderate anemia, was 12 to 17%. The normal sheep averaged 12.6 Gm. of Hb./100 ml. of blood. It was shown that PCV of lambs implanted subcutaneously with a 15

mg. pellet of diethylstilbestrol averaged 37.0%, whereas controls averaged 32.5%.[27] The difference was significant at the 5% level.

Hematologic studies have been conducted on lambs with anemia caused by the parasite, *Haemonchus contortus*, and by exsanguinating, with subsequent treatment of anemic lambs and controls with cobalt and other nutrients. Cobalt has been effective in providing some protection against anemia.[19] Control lambs had Hb. levels from 9.06 to 13.16 Gm. The lambs infected with *H. contortus* had average Hb. levels of 4.42 Gm. without added cobalt in the ration, whereas those given cobalt in the ration had Hb. values of 6.22 to 7.46 Gm. Bonemeal was of no value in increasing Hb. levels.

It has been demonstrated that anemia was more severe in control lambs infected with *H. contortus* than in the previously infected lambs or in those made anemic by exsanguinating and later infected in the same manner as the controls.[4] It is possible that erythropoietin may have been responsible for this protection in the latter 2 groups.[26] In a 50-day experiment, it was shown that a low of 6 to 7 Gm. of Hb. was obtained in parasitized lambs and in animals made anemic by exsanguinating, whereas the controls had average values of 11.78. The addition of cobaltized salt to rations caused a gradual increase in Hb. content of the blood of 52 lambs from birth to 5 weeks.[16] The Hb. level of cobalt-deficient sheep was 9 to 10 Gm. compared with 12 to 13 Gm. for sheep having cobalt added to their rations.[17] The aforementioned data indicate considerably lower Hb. values and PCV when compared with data from lambs in this experiment.

Data obtained from calf trials are presented (Table 2). The differences in

TABLE 2—Average Weights and Hematologic Values of 6 Control Calves and 6 Calves Treated with Iron-Dextran

Age	Weight (lb.)	RBC (10^6/cmm.)	WBC (10^3/cmm.)	Hemoglobin (Gm./100 ml.)	PVC (%)	MCV	MCH	MCHC
24 hr. or less								
Treated	79.3	10.9	14.4	14.2	45.1	41.4	13.3	31.4
Control	81.5	10.7	10.1	15.4	46.8	43.7	14.4	32.9
1 week								
Treated	.....	11.9	14.9	15.9	49.2	41.3	13.4	32.3
Control	.....	11.5	14.5	14.4	44.5	38.7	12.5	32.3
2 weeks								
Treated	.....	12.8	11.3	14.3	48.5	37.9	11.2	29.5
Control	.....	11.3	12.9	14.0	44.6	39.5	12.4	31.4
3 weeks								
Treated	.....	12.8	11.3	14.8	47.5	37.1	11.6	31.2
Control	.....	11.1	13.4	13.9	43.1	38.8	12.5	32.2
4 weeks								
Treated	94.5	12.4	11.7	13.3	48.0	38.7	10.7	27.7
Control	82.8	12.2	11.9	13.7	42.6	34.9	11.2	32.2
6 weeks								
Treated	.....	12.6	11.4	12.5	45.8	36.3	9.9	27.3
Control	.....	11.9	13.5	12.7	41.7	35.0	10.7	30.5
8 weeks								
Treated	.....	13.2	11.8	13.2	43.6	33.0	10.0	30.3
Control	.....	12.5	12.3	14.2	42.4	33.9	11.4	33.5
10 weeks								
Treated	148.5	.....	.....	.....	.....	.....	.....	.....
Control	131.0	.....	.....	.....	.....	.....	.....	.....
12 weeks								
Treated	.....	12.0	13.5	12.5	46.1	38.4	10.4	27.1
Control	.....	13.3	12.4	12.9	39.8	30.0	9.7	32.4
18 weeks								
Treated	.....	11.3	13.7	12.7	38.1	33.7	11.2	33.3
Control	.....	11.8	13.9	13.4	39.7	33.7	11.4	33.8
24 weeks								
Treated	348.8	11.8	12.2	13.8	38.7	32.8	11.7	35.7
Controls	341.8	11.9	14.0	13.4	39.9	33.5	11.3	33.6

weights between treatments when 4 and 10 weeks old were not statistically significant; however, they do follow a pattern similar to the lambs. Average weights of the 2 groups of calves were closer when 24 weeks old than when 10 weeks old. The lamb experiment was terminated at 12 weeks which leaves the question unanswered regarding lamb weights at an older age after a significant treatment effect when 8 to 12 weeks old.

The hematologic data reveal PCV responses similar to the lambs (Table 2). The Hb. values were not affected as greatly as the PCV during the 1st 6 weeks of life. Treatment did not have an apparent effect on total leukocyte count, MCV, MCH, or MCHC.

In one report, investigators injected 10 ml. of iron-dextran into calves shortly after birth and continued the experiment for 4 weeks.[11] The Hb. levels of the control calves decreased from 13.7 at birth to 11.0, 10.6, 9.8, and 10.2 Gm. at 1, 2, 3, and 4 weeks, respectively. The iron injection reduced the decline in Hb. when calves were 1 and 2 weeks old (5% level of significance). The effects of the iron were reduced after the 2nd week. An increase in calf weights was associated with the higher Hb. and PCV.

Newborn calves fed dietary trace minerals, including iron, grew at a faster rate than controls.[13] When 8 weeks old, the difference was significant. When 24 weeks old, the weights of calves in 2 groups were close together. Thus, growth effects from oral iron were similar to those from injected iron. The same observations were made on the hematologic data.[22] The minimal nutritional iron requirement for maintenance of a normal Hb. level in growing calves is approximately 30 mg. a day.[15] Based on this finding, the injection given these calves (1,200 mg.) should have been sufficient for 40 days. By this time, the ration should provide iron adequate to meet the requirements. From these data and those of others,[22,24,28] it appears that an additional injection of iron may be needed in calves and lambs when 4 to 6 weeks old.

Perhaps the investigators in one of the reports cited[11] did not obtain a response with iron-dextran after the 2nd week because of inadequate dose. Ten milliliters (500 mg.) may be sufficient to last only 16 to 17 days. Thus, a suggested dosage for intramuscular injections of iron-dextran is 12 mg. of elemental iron per pound of body weight for newborn lambs and calves as used in this experiment. A 2nd injection may be indicated when 4 to 6 weeks old, depending on the availability of iron from other sources.

Summary

Three milliliters of iron-dextran containing 150 mg. of elemental iron, injected intramuscularly into newborn lambs, produced a significant change in packed cell volumes (PCV) and hemoglobin levels within 1 week, and the effects lasted for 4 weeks.

The treated lambs were significantly larger (3.5 lb.) when 8 weeks old than untreated controls. When 12 weeks old, the treated lambs were 10.8% larger; the difference of 5.1 lb. was significant at the 1% level.

Newborn calves given 24 ml. of iron-dextran (1,200 mg. of elemental iron) per 100 lb. of body weight by injection responded similarly.

A suggested dose for intramuscular injection of iron-dextran for newborn calves and lambs is 12 mg. of elemental iron per pound of body weight. A 2nd injection of iron may be indicated when animals are 4 to 6 weeks old, provided other adequate sources are not available.

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Initiate Program To Eliminate Proprietary Names of Drugs

A cooperative program for the selection of nonproprietary names for drugs has been approved by the American Medical Association board of trustees and the U. S. Pharmacopeial Convention. Objectives of the program are to facilitate selection of a suitable nonproprietary name for each single drug entity and to encourage the use of such selected names wherever indicated in labeling, in advertising, as titles in official compendia, and in scientific literature. — *Drug Trade News (June 12, 1961): 4.*

Newcastle Disease in Turkeys

Charles Gale, D.V.M., Ph.D.; M. G. McCartney, Ph.D.; V. L. Sanger, D.V.M., M.S.

NEWCASTLE DISEASE (ND), which was first identified in the United States in 1944,[2] affects both chickens and turkeys but, generally, it has not been considered a problem to turkey growers in the United States.[6] A number of reports have described the disease in turkeys[2-5,7-12] This report describes the signs, gross and microscopic lesions, and the isolation of ND virus from a flock of adult turkeys.

Clinical Signs and Observations

Clinical signs were 1st observed on March 18, 1959, in a group of 240 breeder hens in house 5 at the Turkey Research Center. At this time, a few hens were making audible respiratory sounds, egg production dropped almost to zero by March 21, 1959, and the few eggs produced were soft-shelled, deformed, depigmented, and had watery albumens (Fig. 1 and 2). Approximately 4 to 6 days before this condition occurred in house 5, an unexplained drop in production had occurred in house 6, but no respiratory signs were observed. Newcastle disease was not diagnosed in this house until later. Subsequently, from these houses the infection spread to 4 other houses, involving 1,048 turkey hens. The only birds which had respiratory signs were those in house 5. The other birds had no signs except lowered egg production and soft-shelled, misshapen, and depigmented eggs. Production fell to near zero in all houses, except No. 8, where it never fell below 26%.

Fertility and hatchability were drastically reduced when compared with the record prior to infection. After ND had run its course, fertility and hatchability returned to preinfection levels in some houses. In general, the most serious effects of the disease were the decline in egg production and deterioration in shell quality,

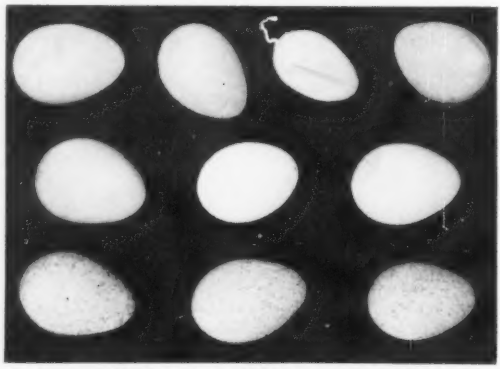

Fig. 1—Eggs from turkeys with Newcastle disease. Top row, misshapen eggs with soft shells; middle row, depigmented eggs, poor texture; bottom row, normal eggs from control turkeys.

which interfered with hatching-egg production for about 2 weeks (Fig. 3).

Virus Isolation and Serologic Observations

As soon as the 1st clinical signs were noticed, blood samples were collected from 7 birds from house 5, and serum samples were submitted for hemagglutination-inhibition (HI) tests in an attempt to detect

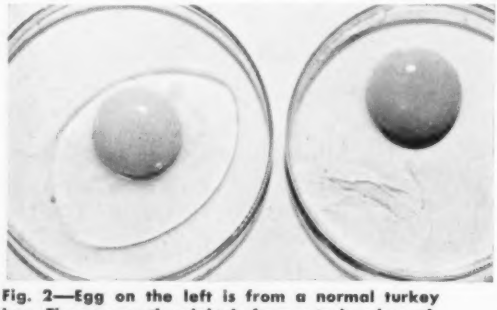

Fig. 2—Egg on the left is from a normal turkey hen. The egg on the right is from a turkey hen affected with Newcastle disease. Notice the watery albumen and complete lack of form.

From the Department of Veterinary Science (Gale and Sanger) and the Department of Poultry Science (McCartney), Ohio Agricultural Experiment Station, Wooster.

TABLE 1—Hemagglutination-Inhibition Titers and Results of Attempts at Virus Isolation of Newcastle Disease Virus from Turkeys

Bird No.	1st serum sample	2nd serum sample (14 days later)	Virus isolation
1	Negative	1,280*	0
2	Negative	1,280	0
3	Negative	640	0
4	Negative	1,280	0
5	Negative	1,280	0
6	Negative	Killed**	—
7	1,280	Killed	—
8	Not available	1,280	—
9	Not available	1,280	—
10	Not available	40	—
11	Not available	1,280	—
12	Not available	20	0
13	10	Killed	+
14	10	Killed	+
15	10	1,280	0
16	80	Killed	—
17	0	1,280	0
18	1,280	Killed	—
19	80	1,280	0
20	1,280	Killed	—
21	1,280	Killed	—

*1,280 highest titer determined.
**Turkeys were killed to obtain tissues for chicken embryo inoculations and other laboratory procedures.
0, not attempted; —, virus not isolated; +, virus isolated.

presence of Newcastle antibodies.* Portions of brain, lung, trachea, and spleen from 2 sick turkeys were macerated separately in Tenbroeck tissue grinders and injected into the yolk sac of 10-day-old embryonating chicken eggs.

These tissues were plated on 5% bovine blood agar plates and on PPLO agar plates enriched with PPLO serum fraction** and yeast extract.** Inoculations using portions of the same tissues from the 2 turkeys were also made into phenol red mediums (Grumbles' modified type), Morton's mediums, and thioglycollate broth, and 7-day-old chicken embryos for isolation of pleuropneumonia-like organisms (PPLO) were employed. Bacteria or PPLO were not isolated. Three blind passages of the embryonating egg material failed to reveal any viral agents.

Additional turkeys were killed from houses 7 and 8, to which the disease had spread. All efforts to isolate an infectious agent failed. When the turkeys in house 9, a large pole barn, appeared to be affected, birds were taken from pens if they had a drop in egg production and were producing poor quality eggs and from pens which appeared to have no sick turkeys. Isolation procedures were the same as those used previously. Virus was not recovered from birds in the pens where a drop in egg production had occurred. Virus was isolated from the other turkey tissues which caused death of chicken embryos when inoculated into eggs. Allantoic fluid from inoculated eggs agglutinated turkey and chicken red blood cells.

In serum samples from turkeys at the onset of this disease, there were no HI titers for Newcastle disease. The same turkeys and others from which blood samples were collected, 14 days later had high HI titers (Table 1). Serum samples taken from turkeys in this house a month earlier for another experiment also had no HI titers for ND.

Allantoic fluid containing the agent isolated above, when inoculated (0.5 ml. intramuscularly) into 3-week- and 6-week-old poults caused prostration and death. The virus was neutralized by specific ND antiserum, whereas normal turkey serum failed to neutralize the virus. Lung and brain tissue from which virus was isolated produced

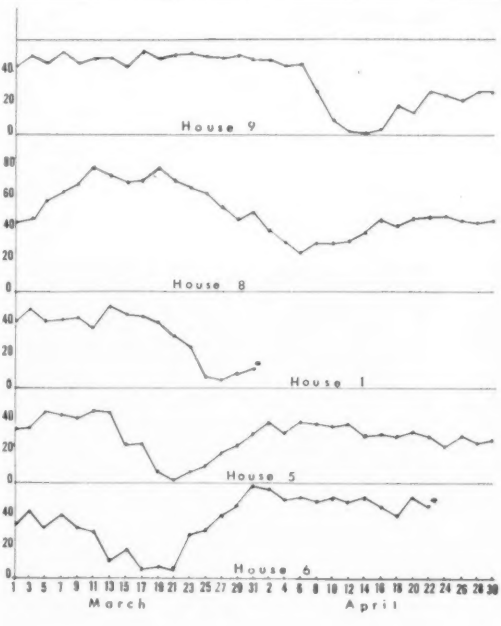

Fig. 3—Percentage of egg production prior to, during, and shortly after Newcastle disease.

*These samples were analyzed by the State Diagnostic Laboratory, Reynoldsburg, Ohio.
**Difco Laboratories, Detroit, Mich.

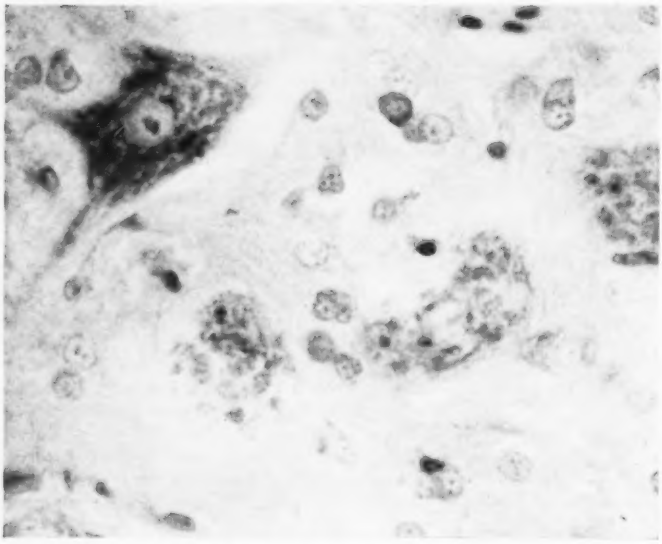

Fig. 4—Tissue from cerebellum of turkey experimentally infected with ND. Neurons are undergoing degeneration. Compare with normal neuron at left. Nissil stain; x 380.

the same results. Characterization of the virus is currently in progress.

Histopathology

Gross pathologic conditions were absent except for a few scattered petechiae found on some hearts at necropsy. Tissues were fixed in 10% neutral formalin. Hematoxylin-eosin stain was used routinely and special stains were employed when needed. Cerebrum and brain stem, cerebellum, medulla, lungs, and trachea were saved from one or more of 3 young experimental turkeys. Lungs, main bronchi, trachea, heart, liver, and spleen were saved from 1 or more of 3 naturally infected adult turkeys.

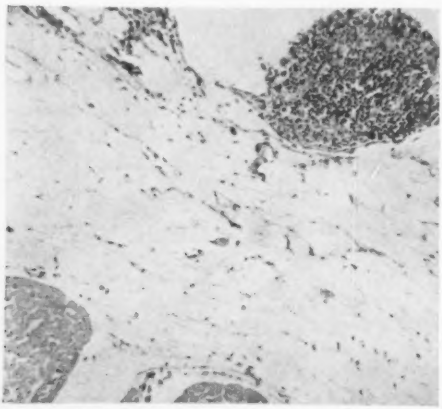

Fig. 5—Tissue from heart of naturally infected turkey. There is marked edema of the epicardium and focal epicarditis. H & E stain; x 53.

Experimental Turkeys.—Extensive neuronal degeneration was present in the cerebrum, brain stem, and cerebellum. Many of these degenerating neurons could be identified only by fragments of cytoplasm (Fig. 4). Other neurons were swollen, had rounded edges or had lost their nuclei. Some neurons were undergoing neuronophagia, although a larger number had satellitosis. Meninges were edematous and separated from the brain. Focal gliosis and perivascular infiltration were present but were not prevalent. No lesions were found in the 2 lungs and the single trachea.

Naturally Infected Turkeys.—Respiratory lesions were extensive in adult birds with natural infection. Free blood completely filled some parabronchi and some respiratory capillaries. Capillary congestion was marked. Many respiratory capillaries were filled with dense accumulations of eosinophilic casts containing epithelial cells, heterophils, and lymphocytes. Adjacent spaces contained edematous fluid and fibrin. Some parabronchi contained exudate consisting of machophages, lymphocytes, heterophils, and debris. The main bronchi in one turkey and tracheas from another 2 contained an eosinophilic, cellular, fibrinous exudate, although at the levels

of the sections the exudate was not attached to the tracheal mucosa. In mucosa and submucosa, there were focal inflammatory reactions with a predominance of lymphocytes.

Pericardial edema, petechial hemorrhages, and focal pericarditis were present in 1 of 2 hearts (Fig. 5). The single liver that was examined had areas of degeneration and necrosis, but the reasons for this were not apparent.

Discussion

The mild respiratory signs in the turkeys involved could easily have been overlooked except for the occurrence of abnormal egg quality and drop in production. The absence of signs of disease in the majority of the birds infected was a distinctive feature. Hemagglutination-inhibition titers of blood serum samples indicated that infection had spread largely in a subclinical form, except for involvement of the reproductive tract. If an infection of birds during the growing season or prior to laying occurred in a similar form, such an infection would very likely go undetected as ND. On the other hand, when the severity of the lesions found in these tissues is considered, it seems peculiar that turkeys infected with ND did not have more pronounced clinical signs.

The method by which this infection was introduced into these flocks is unknown. No active studies with Newcastle virus were in progress at the time. No vaccinations had been given in this flock, and no new birds had been introduced recently.

Summary

Newcastle disease virus was isolated from a flock of 1,048 turkey hens. There was an absence of signs of disease except for mild respiratory signs in 1 of the 5 houses involved. A marked reduction in egg production occurred and, of the few eggs laid, most were soft-shelled, misshapen, and depigmented.

Neuronal degeneration was found in the cerebrum, brain stem, and cerebellum. Respiratory lesions in naturally infected turkeys were extensive. Birds developed HI titers to Newcastle disease after the occurrence of signs of the disease.

The identification of the virus was based on clinical history, pathologic findings, demonstration of HI titers in serum after occurrence of disease, and neutralization of the virus by specific antiserum.

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Simple Immobilization Technique for Pet Birds

Since postanesthetic excitement may result in injury and hemorrhage, a cylinder of paper or thin card lightly rolled round and fixed with adhesive tape may be used to immobilize and calm a bird. This technique is also useful for weighing birds.—*Vet. Rec., 73, (Feb. 18, 1961): 141.*

Editorial

Wanted—A Veterinary Depilatory

A South African report on the use of a commercial depilatory on several animal species (*see* abstr. on p. 440) serves as a reminder that veterinarians may not have given this means of removing hair the attention it deserves.

The Homemade Product

For a good many years, some people, mostly research workers, have made their own depilatory by triturating a mixture of one part powdered detergent and one part barium sulfide, then adding 10% aqueous glycerin solution to make a creamy paste.

This homemade depilatory is inexpensive and effective, but must be handled with care else the skin becomes inflamed or for several days is excessively dry and wrinkled. Neither effect is desirable, especially if surgery is to be performed. The depilatory should be left in contact with the hair no longer than necessary (5 to 10 minutes), dissolved hair must be gently scraped away, and all residue must be carefully and gently removed by thorough rinsing with warm water. If the surgical procedure can be delayed for about 24 hours, the excessive dryness and wrinkling can be avoided by applying petrolatum to the skin and leaving it there during the interval.

The homemade depilatory described above has been used by this writer on sheep and laboratory animals. On an experimental basis, it was also used on several occasions to treat dogs that had a heavy growth of hair in the external auditory canals. (In some dogs, if this hair is not removed periodically, otitis externa occurs.) Such hair is usually removed by the time-consuming method of plucking it with forceps. To remove it with depilatory, a plug of cotton was inserted through the dense hair, stopping short of the tympanic membrane. The outer portion of the canal was then filled with the depilatory cream and, when the hair had dissolved, the canal was gently but thoroughly irrigated, dried, and coated lightly with ointment by means of a cotton-tipped applicator. The results were gratifying but the danger of irritating the sensitive canals is so great that this useful procedure cannot be recommended except to those who have become adept at using the dipilatory on other areas of the body. A commercial depilatory may prove to be more practicable.

Commercial Forms Expensive

Depilatory products found in drug stores in this country retail for about 30 to 40 cents (including federal excise tax) per ounce in powder, cream, or lotion form and at higher prices in pressure spray cans. Would veterinarians be interested in a commercial depilatory prepared and distributed for veterinary use in appropriate size packages and at a price considerably below that of the preparations for human use? They just might be.

Those veterinarians whose assistants have never become highly adept at preparing an area for surgery without making cuts and "scrapes" with a razor should be interested in the use of depilatories. And no matter how careful or adept the operator, there are times when the contour of the body fairly defies the use of a razor. Some species of fur-bearing and laboratory animals are quite difficult to shave and this, too, suggests a use for a depilatory prepared especially for use on animals.—D.A.P.

Toxicity of Wood Preservatives for Swine

Swine in late pregnancy were directly exposed to lumber recently treated with pentachlorophenol (PCP), cresote, and distillate. Acute toxicosis due to PCP and cresote resulted in prenatal and postnatal deaths. Postnatal deaths were attributed to weakness, which often resulted in crushing by the sow, and to toxicosis from consumption of PCP or cresote deposited on the mammary area. Signs included starvation, poor growth, and oral-nasal necrosis. Pigs surviving for 3 weeks after delivery appeared to have a greater tolerence for PCP and cresote.

Toxicosis was not observed in swine having direct contact with lumber properly treated with PCP or cresote or when sufficient bedding prevented direct contact with freshly treated lumber.—[*I. A. Schipper: Toxicity of Wood Preservatives for Swine. Am. J. Vet. Res., 22, (May, 1961): 401-405.*]

White Muscle Disease in Lambs and Calves

A natural myopathogenic ration (clover hay and oats) was fed to seven lots of pregnant ewes as a basal ration. Ewes in six of the lots received additional treatment as follows: lot 2, selenium as Na_2SeO_4, subcutaneously to the lambs; lot 3, oral tocopherol to the lambs; lot 4, 0.1 p.p.m. of selenium in the ewes' ration; lot 5, same as lot 4 plus Na_2SO_4; lot 6, soybean oil meal in the ewes' ration; lot 7, linseed oil meal in the ewes' ration. There was a high incidence of WMD in the lambs of lot 1. All other treatments had a marked effect on the course of WMD in the lambs.

Subcutaneous injections of selenium in lambs was not so effective as when selenium was included in the ewes' ration. Large oral doses of tocopherol to lambs appeared comparable to the selenium treatment of lambs. Inclusion of sulfate in the ewes' ration appeared to interfere with the usage of selenium. Both soybean and linseed oil meals, when included in the ewes' ration, protected lambs.—[*O. H. Muth, J. R. Schubert, and J. E. Oldfield: White Muscle Disease (Myopathy) in Lambs and Calves. VII. Etiology and Prophylaxis. Am. J. Vet. Res., 22, (May, 1961): 466-469.*]

Melanoblastic Tumors in the Dog

Of 88 cases of melanoma in dogs, 59 primary tumors involved the skin; 29, mucous membrane; and 2, the eye. More than 50% of the melanomas of the skin and more than 90% of those of mucous membrane were cancerous. The male to female ratio for melanoma of the skin was 1.4 to 1.0; for melanoma of mucous membrane, 3.1 to 1.0. Noncancerous melanoma of the skin was most frequent at 6 to 10 years of age; cancerous melanoma of skin and mucous membrane, at 11 to 15 years of age.

Melanoma was most common in breeds with moderately or heavily pigmented skin, notably the Cocker Spaniel and the Scottish Terrier. Cancerous melanoma of mucous membrane tended to be of shorter duration than noncancerous or cancerous melanoma of skin.

An approximate correlation between size and degree of aggressiveness was observed for melanoma of skin. Of 29 noncancerous melanomas of skin, 29 were of dermal type. Involvement of epidermis by malignant melanoblasts was recorded in 25% of cancerous melanomas of skin; involvement of epithelium, in 34% of those of mucous membrane. Two new cases of cancerous melanoma of the eye were recorded. The comparative pathologic features of melanoma in man and dog were summarized.—[*R. M. Mulligan: Melanoblastic Tumors in the Dog. Am. J. Vet. Res., 22, (May, 1961): 345-351.*]

Serum of Cattle with Asia-1 Type of Foot-and-Mouth Disease

In chemical and paper electrophoretic studies of 12 cows that had contracted foot-and-mouth disease (FMD) (Asia-1 type), a significant decrease was found in total proteins, albumin, and cholesterol.

Gamma globulin and component II (*beta* and *gamma* lipoproteins) increased significantly during the disease in 9 of 12 cows; blood values (with the exception of total cholesterol) approximated pre-illness levels one month after the onset of illness.—[*K. Perk and K. Lobl: Chemical and Electrophoretic Studies of the Serums of Cattle Infected Naturally with Asia-L Type Foot-and-Mouth Disease Virus, Am. J. Vet. Res., 22, (March, 1961): 217-233.*]

New Books

New Soviet Surgical Apparatus and Instruments and Their Application

This book consists of a series of reports presented at the first scientific session of the Scientific Research Institute for Experimental Surgical Apparatus and Instruments held in Moscow in 1956 to sum up the Institute's first five years of work.

While not of immediate veterinary interest, it is of general interest because of the exposition of the advances in and the indication of the current status of Soviet medical science.

Because of admitted shortcomings in the manufacture of medical instruments and in the development of new technical equipment, a staff of engineers and doctors was given the task of improving, designing, and inventing surgical equipment. It is interesting to note that budgetary as well as standardization and distribution problems were involved. In effect, the engineer and his techniques were brought into the surgeon's field.

The device of most immediate interest is that for mechanical suturing of blood vessels and organs. A description of the mechanical angiorrhaphy device and its use in both clinical and experimental cases is given. Tantalum staples are inserted in such a manner that a tight seal is obtained without constriction of the lumen. I have consulted with some American surgeons, and their opinion is that the instrument works well but requires considerable free length of blood vessel to function and no little skill to operate.

Devices for lobectomy and pneumonectomy are described as are those for commissurotomy, atriorrhaphy, and other heart and lung procedures.

Instruments have been devised and reports are given on apparatus for gastrorrhaphy and enterorrhaphy. This latter is capable of mechanical suturing of large and small intestines with U-shaped tantalum staples in both end-to-end and side-to-side anastomoses.

Advances in electric sleep and electric narcosis are reported as are developments in an ultrasonic scalpel and an ultrasonic device for crushing biliary stones.

There are a number of reports on the development of artificial blood circulation or heart-lung machines and their uses.

Successful replantation of extremities in dogs is reported, along with considerable work on the preservation of organs and transplants.

It should be remembered that five years have passed and that continuing advances must be still being made. However, comparable and even superior work is being done by our surgeons though no one has chronicled their work in book form.

It does no harm for us to be shaken from our complacency and this book contains some surgical "sputniks" to stimulate our surgeons and instrument engineers.

A notice by the publisher explains the necessity of using nonletterpress setting and photolithography and the higher than usual cost of the book.—[*New Soviet Surgical Apparatus and Instruments and Their Application. Edited by M. G. Anan'yew. 222 pages; illustrated. Pergamon Press, 122 E. 55 St., New York 22, N. Y. 1961. Price $12.50.*]—Robert L. Leighton.

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WHAT IS YOUR *Diagnosis?*

Make your diagnosis from the picture below — then turn the page ▸

Fig. 1—Radiograph of the pelvis and hindlegs of a woolly monkey.

History.—A male woolly monkey, 1½ years old, suddenly refused to walk and there were signs of pain in the hindlegs. The monkey had been in good health subsequent to purchase from a pet shop eight months earlier. The diet consisted largely of fruits and nuts. A radiograph of the hindlegs was taken (Fig. 1).

Here Is the Diagnosis

(Continued from preceding page)

Diagnosis.—Incomplete fractures of the tibia and fibula of both hindlegs and generalized osteomalacia (fig. 2).

Discussion.—In the hope that the osteomalacia would be reversible enough to allow sufficient compact bone to form, the fractured legs were splinted with tongue blades, padding, and adhesive tape. The diet was supplemented with commercial monkey crackers, minerals, and vitamins. After 3 weeks, no more fractures had occurred and callus was forming at the sites of the old fractures.

All bones (Fig. 2B), even the vertebrae of the tail, were mottled and the cortices were almost indistinguishable. Under anesthesia, it was determined that all the long bones would bend and were pliable under the slightest tension. The fractures no

(Continued on page 474)

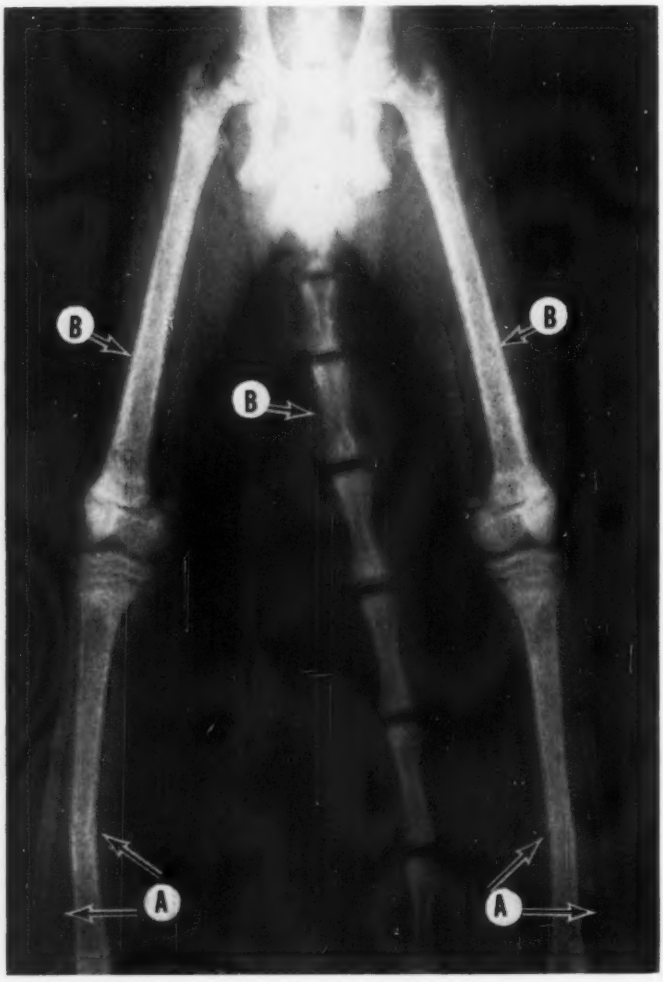

Fig. 2—Radiograph of the pelvis and hindlegs of a woolly monkey with fractures of the tibias and fibulas (A). All of the long bones and vertebrae have signs of osteomalacia (B).

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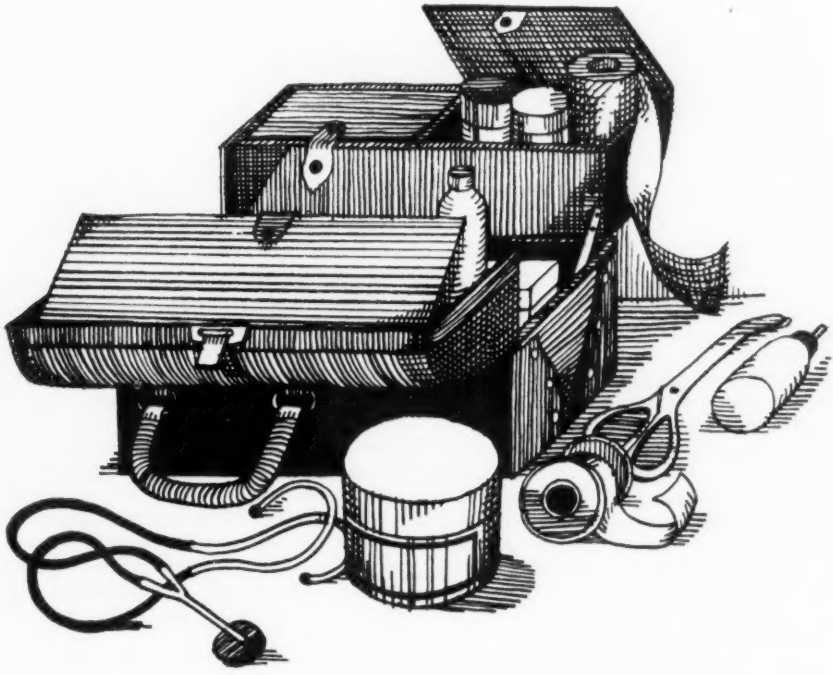


DIAGNOSIS—continued from page 472

doubt occurred as the result of some added stress upon the weakened bones.

Prior to 1930, before the importance of minerals and vitamins was realized, it was difficult to find a simian that had been maintained in captivity for any length of time that had a normal skeleton. Now, with the use of dietary supplements, osteomalacia is rarely seen in zoo or laboratory primates. Even now, the specific nature of this condition is not known. Apparently, widespread use of diets high in minerals and vitamins eliminated the disease from these animals, and investigators lost interest in the problem.

Veterinary practitioners are occasionally asked to treat a pet monkey that is unable to walk or has fractures of the long bones. Such an animal is a household pet usually fed largely on fruits and nuts. These foods are deficient in minerals and proteins, so that after a few months on this diet osteomalacia occurs.

Histologically, the bone seems to grow wildly and is converted into a primitive, porous structure which enlarges peripherally and also encroaches on the medullary cavity. In a photomicrograph (Fig. 3) of the histologic section of a femur, patella, and tibia from a pet monkey that died as the result of dietary osteomalacia, there are greatly thickened, porous cortices and narrowed medullary cavities. From this, it can be seen how the porous appearance of the cortices gives the bones a mottled effect radiographically. The bone is poorly mineralized and, in some cases, the cartilage is not ossified; areas of fibrous bone marrow can also be seen.

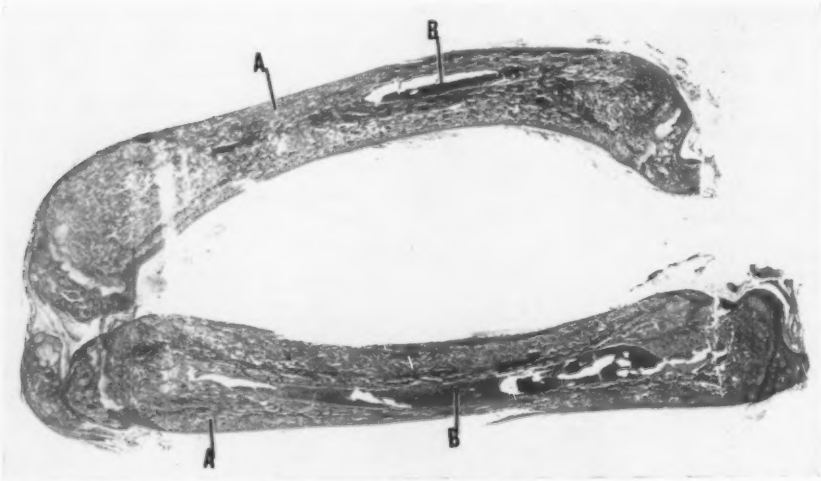


Fig. 3—Histologic section of the femur, patella, and tibia of a monkey affected with dietary osteomalacia. Notice porous, thickened cortex (A) and narrowed medullary cavity (B).

If the malnutrition had occurred early in life, the changes undoubtedly would have been comparable to rickets of young animals. Usually, these monkeys are born and raised in the native environment where they obtain sufficient minerals, proteins, carbohydrates, and sunshine, and complete most of their bony growth before capture. In the majority of cases, the growth plates (epiphyseal plates) are still visible but relatively inactive when the malnutrition related to the animal's new environment causes remodeling in the bones. The result is an osteomalacia that resembles adult rickets.

This case report was submitted by W. H. Brunn, D.V.M., Ruebush Animal Hospital, Silver Spring, Md., and was prepared with the assistance of Wayne H. Riser, D.V.M., M.S., Kensington, Md.

CLINICO-PATHOLOGIC CONFERENCE

From the School of Veterinary Medicine
University of Pennsylvania

First Admission

Dr. R. S. Brodey.—A 132-lb. male Great Dane 5 years old was referred to the University of Pennsylvania Veterinary clinic on May 6, 1957. On May 1, the dog vomited three to four hours after eating its regular meal. No bowel movements occurred for the next few days, and the urine was red-tinged. On May 2, the hemoglobin (Hb.) was 10 Gm./100 ml.; red blood cell count (RBC) was 3,970,000, and the cells were hypochromic; white blood cell count (WBC) was 20,600 with 73% neutrophils (57% segmented and 16% nonsegmented), 20% lymphocytes, 6% monocytes, and 1% eosinophils. The urine was cloudy and contained bile (2 plus), protein (2 plus), occasional granular casts, and 8 to 10 WBC per high power field (x 450), on microscopic examination.

On physical examination on May 6, the abdomen was tense and peristaltic sounds could not be auscultated. Mucous membranes were pale, temperature was 104 F., respiration rate 32, and pulse rate 40. There was an increased vesicular murmur, especially on inspiration. Radiographically there was a large symmetrically shaped mass filling most of the abdomen caudal to the stomach. The Hb. was 8.5 Gm./100 ml.; packed cell volume (PCV) 26%; RBC 3,550,000; mean corpuscular hemoglobin concentration (MCHC) 24%; mean corpuscular volume 74 cubic microns ($c\mu$); WBC 35,050 with 82% neutrophils (77% segmented and 5% nonsegmented), 15% lymphocytes, 2% basophils, and 1% monocytes. The urine was coffee-colored, acid, and contained protein (4 plus), bile (1 plus), RBC (1 plus), WBC (2 plus), and amorphous urates (4 plus). There was no bromsulphalein (BSP) dye retention in 30 minutes; the total serum protein was 6.2 Gm./100 ml.

Prepared by:

R. S. Brodey, D.V.M., M.Sc. (V.S.)

Assistant Professor of Veterinary Surgery

J. E. Prier, D.V.M., Ph.D

Associate Professor of Virology

On May 7, the temperature was 103 F.; respiration rate was 32 with a double expiratory movement. The dog was in poor condition and its mucous membranes were pale. The abdomen was tense; digital pressure in the xiphoid area and caudal to the costal arches resulted in evidence of pain and gave a feeling of fullness. The urine was coffee-colored and formed greenish yellow foam when agitated. The following day the temperature was 103.5 F., and mucous membranes were extremely pale. The Hb. was 7.5 Gm./100 ml., RBC 3,070,000, WBC 41,050 with 64% neutrophils (55% segmented and 9% nonsegmented), 30% lymphocytes, 3% eosinophils, and 3% basophils. The serum alkaline phosphatase level was 14.7 Bodansky units. Blood and urine

cultures were negative. On May 10, the temperature was 102.3 F., and the dog was anorectic. The patient's blood was incompatible with blood from 3 regular hospital donors; compatible blood was finally obtained from a female littermate. An exploratory laparotomy was performed on the following day, and whole blood was administered intravenously.

The dog's condition improved progressively following surgery despite localized suppuration of three days' duration at the cranial portion of the abdominal wound. On May 13, Hb. was 9.3 Gm./100 ml., PCV 28%, RBC 3,980,000, WBC 28,800 with 96% neutrophils (83% segmented and 13% nonsegmented), 2% monocytes, 1% eosinophils, and 1% lymphocytes. There were 3 nucleated RBC's per 100 WBC's and polychromatophilia. On May 18, the urine was normal and Hb. was 12 Gm./100 ml., PCV 38%, RBC 5,090,000, WBC 16,000 with 93% neutrophils (81% segmented and 12% nonsegmented) and 7% lymphocytes. There were 4 nucleated RBC's per 100 WBC's with anisocytosis and slight polychromatophilia. The dog was discharged from the hospital on May 23.

Second Admission

Dr. R. S. Brodey.—On June 28, the dog was in excellent condition. The Hb. was now 14 Gm./100 ml., PCV 44%, RBC 6,248,000, and WBC 10,500. The dog remained in good health until September 10 when it suddenly became anorectic. Three days later there was stiffness of the left foreleg and, to a lesser extent, the right foreleg, and reluctance to raise the head and neck was observed. From September 14 to 17, the appetite improved slightly and the temperature remained normal, but the stiffness worsened. When the neck was extended, the dog cried in apparent pain and began chewing its forepaws. On the morning of September 22 it ate a good meal, but later in the afternoon it vomited after drinking water, it continued to retch and vomit mucus the rest of the day. At 7:30 p.m. its oral mucosa became very pale after a severe bout of retching and vomiting. By 10:30 p.m. the temperature was 103.0 F., marked polypnea was present, and the dog was apathetic. At 3:00 a.m. the next morning the temperature was 104.5 F., the pulse weak and rapid, and there appeared to be exquisite tenderness over the left anterior quadrant of the abdomen. By noon the temperature had risen to 106.0 F., and the dog would rise on its elbows with its tongue protruding and whine at each inspiration. The apparent pain in the anterior abdomen soon became even more intense and the dog appeared to be in agony when placed on its back. It was rushed to this clinic and died two minutes after arrival.

Clinical Discussion

*Dr. D. F. Patterson.**—In discussing this very interesting case, I would first like to summarize it in my own words and then develop what I consider to be the salient features as they fit into the differential diagnosis.

We have an old Great Dane (5 years of age must be considered old in this breed) examined originally because of vomiting, red-tinged urine, and no bowel movements for two days. On physical examination, there was a large abdominal mass and abdominal pain. The description of the mass and its appearance in abdominal radiographs would correspond to the spleen. Fever, normocytic-normochromic anemia, neutrophilic leukocytosis, and eosinophilia were present. Serum protein concentrations and liver function were normal; there were bilirubinuria and proteinuria.

During the two days following admission, fever continued; there were progressive anemia, rising neutrophilic leukocytosis, and continued bilirubinuria as indicated by the coffee-colored urine which formed a greenish yellow foam when agitated. The serum alkaline phosphatase was markedly elevated. We will come back to this finding later.

After an exploratory laparotomy, there were rapid improvement, a marked fall in circulating lymphocytes, evidence of accelerated erythropoiesis, and clinical recovery. Although I have not been so informed from the case history, it is my assumption that the mass, which I believe to be the spleen, was removed at surgery. This seems to be the most likely explanation of the marked fall in circulating lymphocytes after surgery.

*Dr. Patterson is instructor in cardiology.

Two months after rapid and complete recovery, the dog had signs of stiffness and pain in the forelegs and neck and probably paresthesia in the forelegs, suggesting a cervical cord lesion resulting from cervical intervertebral disk herniation. Twelve days following the onset of these signs, the dog suddenly had severe and persistent vomiting, high fever, severe abdominal pain, and signs of peripheral vascular collapse which ended in death within 24 hours. It is noteworthy that the terminal acute signs occurred suddenly in a dog which had eaten a good meal a few hours earlier.

First, let me say that attractive as the possibility might seem, I do not believe that we are dealing with one disease entity but, at the very minimum, two separate conditions. Let us begin with the initial ailment.

The chief signs, on initial examination of the dog, were those of the apparently sudden appearance of a large abdominal mass, abdominal pain, and progressive anemia, suggesting blood destruction and fever. The normocytic-normochromic character of the anemia and the presence of marked bilirubinuria and the gross appearance of the urine suggest that the anemia was due to increased blood destruction, rather than from blood loss or decreased blood production. The description of the abdominal mass and the radiographic appearance of the abdomen suggest that the mass was in the area of the spleen. That the mass is in fact the spleen, however, must be proved. At least it should not be accepted immediately until other possibilities are ruled out.

We might consider other organs by examining more closely the information we have. First, the normal bromsulphalein dye retention test and the normal serum proteins indicate that at least two liver functions are intact and would tend to rule out the liver as being involved. The radiographs are not entirely clear due to the large size of the dog, but it appears that the mass is located caudal to the liver, and that it nearly fills the entire abdomen. Before we rule out the liver as being involved in the mass, however, we must consider the elevated alkaline phosphatase, which can result from biliary obstruction, rickets, and conditions associated with bone destruction. I am unable to explain the elevated level in this case, since there is little evidence that any of the above mechanisms are involved. For this reason, I am not inclined to consider the finding too seriously, especially since we have only one test result.

The finding of proteinuria, hematuria, and white blood cells in the urine, and the early suggestion of red-tinged urine, must cause us to consider that primary renal disease could be present. The lack of a blood urea nitrogen test, or other indexes of renal function, however, make it difficult to evaluate the status of the kidneys. It should be pointed out that renal tumors can appear as large abdominal masses with hematuria and proteinuria. Since both kidneys appear normal radiographically, however, this possibility seems remote. It is more likely that the abnormal urine is a manifestation of renal changes accompanying severe systemic disease. These changes can occur in severe acute anemia or vascular shock from any cause.

Having eliminated at least the most important possibilities for an abdominal mass such as the one described, I believe we can return to the spleen and base our further speculations on the fact that the mass does represent the spleen, or some process involving the spleen. There are several situations in which splenomegaly and anemia are associated.

1) Hypersplenism, either primary or secondary, is a condition in which the spleen assumes an abnormal role, destroying large numbers of red blood cells or suppressing the formation of new cells in the marrow. A case in a dog, resembling Banti's syndrome or congestive splenomegaly of man, was described by Marshak.[2] This is an example of secondary hypersplenism, apparently related to the sequestration of blood in a congested spleen. The primary lesion in this disease is liver cirrhosis resulting in interference with splenic venous return. We have observed what appeared to be secondary hypersplenism in dogs with lymphosarcomatous involvement of the spleen.

To my knowledge, primary hypersplenism has not been reported in the dog. In man, all cellular elements of the blood may be depressed so that leukopenia, anemia, and thrombocytopenia are all present.

2) Splenic hematoma or splenic hemangiosarcoma with hemorrhage into the tumor mass or into the abdomen may give a picture of acute collapse with anemia and the presence of an abdominal mass. The anemia

in these cases is characteristically that of blood loss, and usually there is no evidence of blood destruction as we have in this case. Also, pain and fever are not prominent signs. The absence of any history of trauma would suggest that the condition was not splenic hematoma.

3) Enlargement of the spleen due to extramedullary erythropoiesis may occur in anemia from many causes. The size of the spleen in these cases does not approach that seen here, and abdominal pain is usually not present.

4) Torsion of the spleen is accompanied by sudden severe abdominal pain, often vascular shock, and may result in death within a short time if the arterial supply is severely impaired and infarction occurs. If the torsion results in a constriction of venous return more than arterial supply, the spleen may sequester large volumes of blood and reach an enormous size. The sequestration of blood in the spleen and its incubation with the normal red blood cells could theoretically cause increased red blood cell destruction similar to that which occurs in congestive splenomegaly.

For the diagnosis of the original ailment in this case, I would favor the last of the possibilities discussed, that of torsion of the spleen with increased blood destruction. If torsion of the spleen occurs in large dogs more easily than in small ones, as does torsion of the stomach, the fact that the patient we are discussing is a Great Dane adds some weight to this diagnosis. The surgical procedure which so dramatically resulted in the dog's recovery, at least temporarily, was probably splenectomy. If torsion of the spleen was the correct diagnosis, this certainly would be the expected result.

The subsequent course in this dog is as interesting as the original illness. I feel on much less firm ground, however, since we have apparently only the owner's description, albeit quite detailed, from which to make a diagnosis.

The signs of pain and stiffness in the neck and forelegs resemble those of cervical disk protrusion. In this breed, perhaps, we should also consider ossifying pachymeningitis. These signs, however, may not be related to the terminal event.

I am impressed by the sudden onset of the terminal signs which occurred following a good meal and ended in death within 24 hours. Signs of upper gastrointestinal obstruction, of irritating severe abdominal pain, and apparently peripheral vascular collapse would describe the terminal events very well, I think. The high fever was an interesting finding and suggests peritonitis due to infection or some other cause.

Because of the breed of this dog, and the occurrence of the terminal episode following a meal, we must seriously consider torsion of the stomach as a possibility. One important sign which is lacking, however, is abdominal distention due to collection of gas in the stomach. This is usually marked in these cases.

Another acute abdominal disorder which can present signs similar to those described is acute hemorrhagic pancreatitis, which may run a rapid course ending in collapse and death. Vomiting and fever are usually marked.

Without more to go on, I believe any type of acute upper gastrointestinal obstruction could produce the signs described in this dog. It is difficult to relate the ultimate cause of death to the original illness.

Clinical Diagnosis

First Admission.—Splenic torsion.

Second Admission.—Acute abdominal catastrophe, such as gastric torsion, acute pancreatitis, or acute peritonitis.

Surgical Findings (May 11)

Dr. R. S. Brodey.—There was a 180 degree torsion of the splenic pedicle accompanied by a severe congestive splenomegaly. The huge symmetrically enlarged spleen weighed 5 lb. The splenic pedicle was thickened greatly, highly inflamed, and contained areas of fat necrosis. Splenectomy was difficult because of the extensive inflammatory changes in the pedicle, and it was difficult to delineate the greater curvature of the stomach. Histologically, the splenic vessels were extensively thrombosed and there were large areas of splenic congestion and infarction.

Pathologic-Anatomic Findings (September 23)

*Dr. R. M. Sauer**.—The main necropsy finding was acute diffuse exudative peritonitis secondary to a well-defined, 1-cm. perforation of the greater curvature of the stomach. Other abdominal and thoracic viscera appeared normal. The brain and spinal cord were not examined at necropsy due to cosmetic considerations.

Dr. R. S. Brodey.—In an experimental study of splenic infarctions,[1] it was demonstrated that the alkaline phosphatase concentration (normally high in splenic tissue) was markedly depleted in the infarcted areas, with a subsequent rise in the serum levels of this enzyme. I believe that the high serum alkaline phosphatase level in this dog was related to the extensive splenic infarction following torsion of the pedicle.

The gastric perforation leading to a fatal peritonitis is more difficult to explain. It was probably related to the splenectomy, at which time the gastric wall may have been injured because of the difficult nature of the operation. Progressive thrombosis of vessels in the area of the greater curvature may have eventually led to focal necrosis, perforation, and chemical peritonitis due to the escape of the highly acid gastric juices into the peritoneal cavity.

*Dr. R. M. Sauer is assistant professor of veterinary pathology.

Pathologic Diagnosis

First Admission.—Splenic torsion.

Second Admission.—Gastric perforation and diffuse peritonitis.

References

[1]Highman, B., Thompson, E. C., Roshe, J., and Altland, P. D.: Serum Alkaline Phosphatase in Dogs with Experimental Splenic and Renal Infarcts and with Endocarditis. Proc. Soc. Exptl. Biol. & Med., 95, (May, 1957): 109-112.

[2]Marshak, R. R.: A Probable Case of Banti's Syndrome in a Dog. J.A.V.M.A., 135, (Oct., 1959): 388-390.

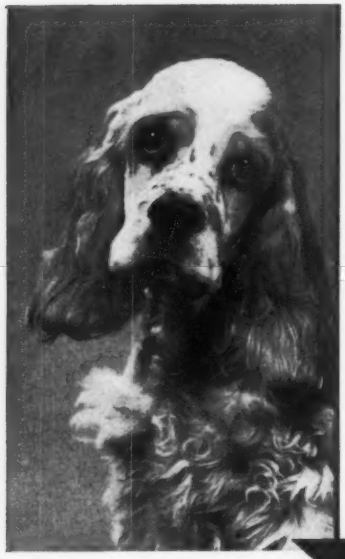
Last World War II K9 Corps Dog Dies

Old Sarge, a German Shepherd Dog who had celebrated his 20th birthday April 16 in Hollywood, is dead. Sarge, a Marine Corps buck sergeant, was 1 of the 3 most decorated dog veterans of World War II.

In his 5 years with the U.S. Army and Marine Corps, Sarge earned 9 citations which include the Purple Heart with 2 clusters and the Silver Star Medal for heroism under fire. Sarge is more formally known as Major von Luckner III. He was owned by Mrs. Jeanne Platt since he was 6 months old.

Sarge was the 1st animal to be buried in a new pet cemetery in Huntington Beach, Calif. He was given full military rites by the Marine Corps League of California.

Sarge is shown at his 20th birthday party, with his USMC dress blues and his 9 citations. More than 100 friends gathered to help the lame and nearly blind dog celebrate. Shown with him are (left to right) Mrs. Jeanne Platt, his owner, and Mr. Dean Devenish and Mr. C. E. Wise of Kal Kan, Inc.



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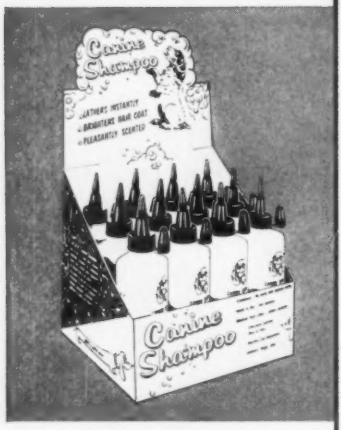

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One of the most troublesome problems encountered in dairy cattle practice is congestion of the mammary gland, either shortly before, or immediately following, parturition. This physiologic, noninfectious swelling—with its concurrent pain, often causing discomfort to the animal during the milking process—is frequently encountered in high-producing cows. Mammary edema is particularly bothersome in first-calf heifers. The onset of lactation places a heavy strain on the udder, resulting, in some cases, in a premature breakdown of the udder attachments, proneness toward udder injury and difficult accommodations to the milking machine, or premature development of a "seedy" udder. It may also lead to lost revenue as a result of reduced milk production.

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The removal of excess fluid from edematous tissues is now possible through the use of DIURIL Boluses. This exceptionally potent, orally effective diuretic, by relieving udder edema, facilitates handling of high-producing cows *and* heifers during the onset of lactation. By removing abnormal stress on mammary attachments, DIURIL may also help preserve the contour of the udder and prolong the productive life of quality animals—when used as an adjunct to good management.

Other edematous conditions that can profit from the saluretic action of DIURIL Boluses include swelling of the ventral portions of the body, often without apparent cause, and edema connected with certain general infections or allergic-like reactions.

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FOR A PROFESSIONAL SAMPLE, write: Merck Chemical Division, Merck & Co., Inc., Rahway, New Jersey.

NOTE: Milk taken from dairy animals during treatment, and for 3 days after the latest treatment, must not be used for food.

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- **FRESH COW—POSTPARTURIENT UDDER EDEMA (Pitting)**—Treated with 2 Gm. DIURIL daily for 3 days. Results were excellent. "This was an old cow with extremely large udder . . . owner fully expected to lose her. DIURIL is, I believe, responsible for her still being in the herd."
- **9-YEAR-OLD HOLSTEIN—ACUTE EDEMA OF UDDER; BREAKDOWN OF ATTACHMENTS**—Udder was supported. Cow was given 2 Gm. DIURIL b. i. d. for 3 days. Condition much improved in three days.
- **2-YEAR-OLD FRESH HEIFER—ACUTE EDEMA OF UDDER, TEATS AND ABDOMEN**—2 Gm. of DIURIL given b. i. d. for 3 days. In 24 hours, teats had softened considerably.
- **FIRST-CALF HEIFER—SEVERE CONGESTION OF UDDER AND VENTRAL EDEMA DUE TO PARTURITION**—2 Gm. DIURIL given morning and night for 3 days. 70 to 85% reduction of swelling in 3 days.
- **25 FRESH HEIFERS AND COWS—MODERATE TO SEVERE PARTURIENT MAMMARY EDEMA**—All cases treated with 1.5 Gm. DIURIL b. i. d. for 3 days. In every instance, udder congestion relieved in 3 to 4 days. In 7 animals, treatment was administered on the fourth day; in these cases, the udder tissue was free of edema on the fifth morning.

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Indications

For use in cattle to treat postparturient udder edema and other edematous conditions arising from a fluid and electrolyte retention.

Dosage

Usual dosage is 2 Gm. once or twice a day for three or four days.

Advantages of DIURIL

DIURIL represents a new approach to diuretic therapy. In several species of laboratory animals, as well as man, it has been shown to be an exceptionally potent, orally effective, nonmercurial diuretic agent. Since the principal action of DIURIL is a marked enhancement of the excretion of sodium and chloride in approximately equivalent concentrations, it has been designated a saluretic agent. This new compound has a potency equivalent to that of the organic mercurials without the potential toxicity of the mercury ion. Owing to its saluretic pattern of effect and maximal oral potency and efficacy, DIURIL is ideally applicable both in initiating diuresis and in maintaining the edema-free state in edema-producing conditions.

Clinical Indications

In high-producing first-calf heifers, severe udder edema may delay full milk production, and in older cows the great increase in size and weight of the gland may predispose to the premature breakdown of the udder attachments. Prompt removal of the excess fluid by the use of DIURIL can be of great advantage in such conditions. Other edematous conditions arising in the limbs or ventral portions of the body, often without apparent cause, or connected with certain general infections or allergic-like reactions, are also occasionally problems in cattle. The effective saluretic action of DIURIL may produce rapid relief from such symptoms by inducing prompt loss of excess fluid.

Precautions

DIURIL is a potent compound in its influence on electrolyte excretion and, as a result, dosage and administration must be individualized. As with other potent diuretics, the patient should be regularly and carefully observed for the early signs of fluid and electrolyte imbalance and appropriate measures taken to prevent or correct such imbalance if it occurs. The early clinical signs and symptoms of fluid and electrolyte imbalances, whatever the cause, are increased thirst, weakness, lethargy, drowsiness or restlessness, fatigue, oliguria, gastrointestinal disturbances and tachycardia.

NOTE: Milk taken from dairy animals during treatment, and for 3 days after the latest treatment, must not be used for food.

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Public Relations

Auxiliary Raises $50,000 for AVMA Fellows

One of the greatest services to members of the AVMA has been performed by the members themselves with the help of the Women's Auxiliary to the AVMA.

Last year, the 7,500 members of the Auxiliary responded to an AMVA appeal for help for its Fellowship Program by mobilizing a nation-wide fund-raising campaign. Launching the campaign in February, they sought to raise $75,000 from AVMA members in a person-to-person effort. The AVMA assisted the Auxiliary in its campaign by supplying information about the Fellowship Program and other campaign materials. The real work, however, was done by the women at the local level who took the time and energy to contact nearly all of the AVMA's more than 16,000 members.

On June 30, the official closing date of the program, the women had collected more than $50,000 in contributions and pledges. Their efforts made it possible for the AVMA to support 11 graduate Fellowships this year for deserving veterinarians (JOURNAL, July 15, 1961, pp. 182-184). The Auxiliary is encouraged by the results of this year's campaign and is designing a program to raise even more funds next year.

Awards will be presented at the Detroit meeting to the auxiliaries in those states which have demonstrated the greatest achievement in collecting funds.

To the members of the profession whose generosity has made it possible for the AVMA Fellowship Program to continue, and to the women who have worked so diligently on behalf of the campaign, our hats are off in gratitude.

Total Contributions and Per Cent of Quota Reached by Auxiliaries in Each State

State	Total contributions	% of state quota raised	State	Total contributions	% of state quota raised
Alabama	$ 457.50	39.6	Nevada	$	....
Alaska	....	....	New Hampshire	123.00	42.0
Arizona	309.00	49.8	New Jersey	878.00	58.0
Arkansas	465.00	98.5	New Mexico	292.00	72.0
California	3,062.75	45.9	New York	4,063.00	88.2
Colorado	960.50	64.1	North Carolina	279.00	23.5
Connecticut	415.00	50.2	North Dakota	234.00	57.7
*Delaware	301.39	122.4	Ohio	2,324.10	63.7
Dist. of Columbia	80.00	24.0	Oklahoma	290.00	26.0
Florida	1,318.00	73.4	*Oregon	1,185.50	122.3
*Georgia	1,539.00	112.4	Pennsylvania	1,367.00	47.1
*Hawaii	220.00	126.1	*Rhode Island	360.00	369.3
Idaho	436.00	72.6	South Carolina	454.50	81.3
*Illinois	6,802.50	162.5	South Dakota	469.00	71.4
Indiana	1,579.00	64.0	Tennessee	859.00	88.6
Iowa	2,881.00	77.9	Texas	613.00	18.8
Kansas	647.00	37.1	Utah	424.00	89.8
Kentucky	536.00	51.0	*Vermont	417.00	135.5
Louisiana	314.50	42.3	Virginia	880.00	58.3
Maine	305.00	80.3	Washington	757.00	45.8
Maryland	540.00	34.1	West Virginia	236.00	82.1
*Massachusetts	1,453.00	128.7	*Wisconsin	2,331.00	107.2
Michigan	1,304.00	47.0	Wyoming	168.00	57.4
*Minnesota	2,556.50	102.3	Canada	130.15	5.3
Mississippi	166.25	29.5	Miscellaneous		
Missouri	402.00	16.9	Contributions	615.00	....
Montana	193.00	32.2	Outstanding Pledges	1,257.00	....
Nebraska	773.50	53.7	Total Quota $75,000.00	$51,023.64	68.1%

*Denotes states which reached or surpassed their quota.

s/R. D. MORRISON
Director, Membership Services

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History of the AVMA

1916

At the meeting in Detroit, President R. A. Archibald noted some of the major achievements of the year: acquisition of the *American Veterinary Review* as the official organ of the Association; passage of the long-sought-for Army bill; and the eradication of the outbreak of foot-and-mouth disease. And concerning matters of immediate importance to the Association, ". . . the first problem that strikes us most forcibly is that of reorganization." Among the points to be considered, Dr. Archibald suggested affiliation of state associations with the AVMA, provision for a president-elect, a full-time secretary, and a managing editor for the JOURNAL.

A decision to restrict publication of papers and committee reports presented at the meetings to the JOURNAL was deplored by D. M. Campbell; *Veterinary Medicine* carried a comprehensive report of the Detroit meeting only a week after the meeting ended. A primary purpose in acquiring the *Review* had been as a vehicle for the proceedings of the meetings and, for several years, Merillat and Campbell noted: ". . . it was little more than an installment publication of the proceedings of the AVMA, in lieu of the annual bound volumes." It might be noted, however, that while the new *Journal* carried some 600 pages of Association matters and papers its first year (1916), considerably more of the remaining 1,100 pages was devoted to scientific subjects than had been the case with the *Review* in its declining years.

A major change in AVMA reorganization was the provision for election of members of the Executive Board by districts; by gentlemen's agreement the five vice-presidents had been elected on a regional basis, and voids in representation could be filled by discretion of the president, who appointed six members. But in 1906, for example, there was no one in the official family who resided west of Chicago. Continuity on the board was also provided for by election for five-year terms on a rotating basis. In three successive years (1910-1912), 34 men had served one year each; one secretary served two years; and only the treasurer and librarian served all three years.

In noting that America had about 20,000 veterinarians, N. S. Mayo suggested: "America is now fairly well supplied with veterinarians. The demand is not for more veterinarians but for veterinarians with a more thorough training, not only in strictly professional lines, but in related lines, which will make them not only more efficient as professional men but more useful to society at large."

C. E. Cotton was elected president, and L. A. Merillat, secretary. F. H. Schneider was re-elected treasurer.

✦ ✦ ✦

ROBERT A. ARCHIBALD was born in Ireland in 1870, came to the United States in 1887, and graduated from the Chicago Veterinary College in 1891, following which he is said to have started practice in California on $20 borrowed from a colleague. In 1899, he became city veterinarian and assistant bacteriologist for the city of Oakland, professor of bacteriology in the Oakland College of Medicine in 1908, and the same concurrently in the San Francisco Veterinary College in 1909.

Dr. R. A. Archibald, AVMA president in 1915.

Active in association work, Dr. Archibald was three times president of the California V.M.A., member and president of the state examining board, and twice an AVMA vice-president before being elected president in 1915. He is credited with being the first to advocate reorganization of the AVMA along lines that would make it a truly national body. Dr. Archibald died on March 14, 1922.

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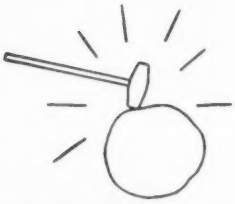

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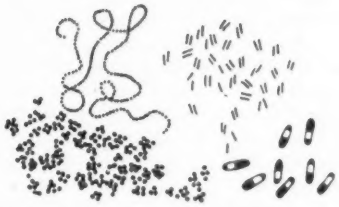

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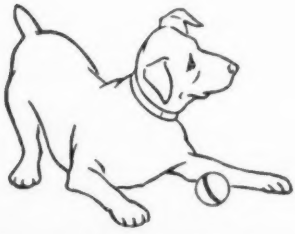

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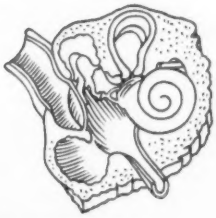

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COUNCIL REPORT

AVMA Council on Biological and Therapeutic Agents

The Status and Use of Phenothiazine in Cattle

In order to clarify the present status of phenothiazine as a veterinary anthelmintic, to define the desirable physical characteristics of the chemical insofar as safety and efficiency are concerned, and to assist in the development of uniform recommendations for its use in parasite control programs, the following summarization is presented.

An objective consideration of chemical control measures that have been widely employed against parasites of livestock throughout the world clearly shows that phenothiazine is the one outstanding veterinary anthelmintic. The drug combines an unusual margin of safety, a high degree of efficiency, a unique range of applications, an ease and versatility of administration, and a variation of antiparasitic actions not found in any other anthelmintic. Moreover, there is no evidence its use in food animals presents a consumer hazard, although certain prudent precautionary measures must be taken in the case of dairy animals.

It is recognized that phenothiazine has certain inherent disadvantages: therapeutic doses are bulky, breakdown products are eliminated as a red dye which stains the wool of sheep and discolors milk, and it is deficient in desired efficacy against some injurious parasites. Despite these shortcomings, there is little evidence that newer treatments are superior to it.

The need for alternative chemicals with an over-all usefulness paralleling, or exceeding, that of phenothiazine is clearly recognized. Indeed, it would be highly desirable to have several chemical agents of this kind that could be recommended to livestock growers with confidence. In recent years, increasing attention has been given to the development of alternative treatments.

This report, approved by the AVMA Council on Biological and Therapeutic Agents, was compiled by A. O. Foster, director, Beltsville Parasitological Laboratory, Agricultural Research Service, USDA, Beltsville, Md.; J. R. Douglas, professor of parasitology, School of Veterinary Medicine, University of California, Davis; A. C. Todd, professor of parasitology, Department of Veterinary Science, University of Wisconsin, Madison; and F. D. Enzie, leader, antiparasitic investigations, Beltsville Parasitological Laboratory, Beltsville, Md.

Physical Properties

Optimum physical properties have not been definitively established, but higher therapeutic efficiency has been associated with purified products and with National Formulary grade products of small particle size. On the basis of present information, the best available phenothiazine preparations may be characterized as (1) N.F. grade products with an average particle size of 2.5 to 3.0 μ as determined by the Fisher Subsieve Sizer, and (2) purified products with an average particle size of 6.0 to 7.0 μ.

Therapeutic Doses

Ordinarily, a satisfactory dosage for cattle is 20 Gm./100 lb. up to a total dose of 60 Gm. In severe parasitism, however, doses up to 120 Gm. may be given at the discretion of the attending veterinarian. The division of therapeutic doses into 2 or more equal portions to be given on successive days is not recommended, and there is no substantial evidence that consumption of phenothiazine in or on feed is satisfactorily augmented by flavoring or masking agents.

Low-Level or Free-Choice Regimens

From the standpoint of practical usage, there is little justification or indication for dosages larger than 2.0 Gm. per head daily, or 0.5 Gm./100 lb. for calves up to 400 lb. It is recognized that palatability, mineral content of feed and water, and other undetermined factors influence the consumption rate of salt and mineral supplements in different geographical areas. Optimum drug concentrations in these mixtures, therefore, must be determined in accordance with local conditions and practices. Adequate dosages have been obtained with ratios of 1 part phenothiazine to 10 to 40 parts of salt or mineral supplement.

Appreciable suppression of egg production and larval development is obtained against *Haemonchus*, *Oesophagostomum*, and *Bunostomum*. The regimen has not been uniformly effective against other gastrointestinal species but, in some instances,

it has proved of value against *Ostertagia* and *Trichostrongylus*. The influence of particle size on oogenesis has not been adequately determined although limited evidence obtained with gastrointestinal helminths of sheep suggests that the finer particles may have a greater effect on species inhabiting the abomasum and small intestine and a lesser effect on those in the large bowel. There is some evidence also that purity may have a measurable effect on egg production or larval development.

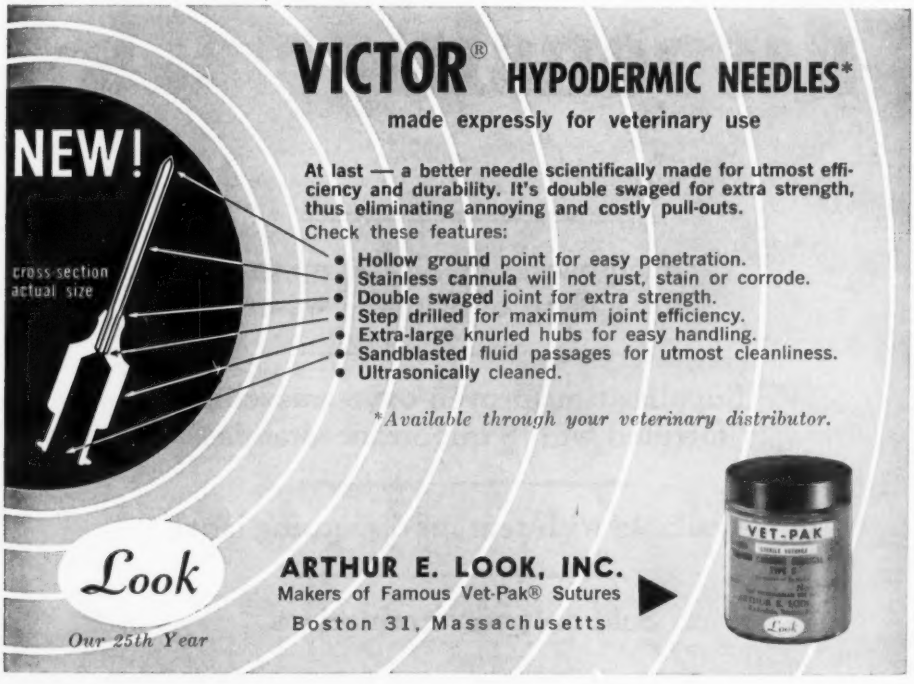
There is no indication that free-choice regimens adversely affect growth rate or interfere with normal reproduction and fertility.

Use in Dairy Animals

Neither therapeutic nor free-choice regimens are recommended for dairy animals in production. Therapeutic treatment may be employed when circumstances require it, if the milk is discarded for at least 96 hours after medication. Phenothiazine metabolites (e.g., phenothiazone) may be present also in the milk of animals on low-level regimens, particularly in animals near the end of the lactation period.

Phenothiazine Resistance

There is little experimental evidence that therapeutic treatment and low level-regimens are responsible for the occurrence of parasite strains that do not respond to conventional doses of phenothiazine. The potential influence of these factors is not discounted, however. Two strains of *Haemonchus contortus* in sheep, one in Kentucky and one in Maryland, had a measurable tolerance to the chemical; but a similar response has not been demonstrated in other ovine or bovine *Haemonchus* strains that have been exposed to low-level regimens for similar or longer periods. To the present, the phenomenon has not been reported in connection with any other gastrointestinal helminths in either host. More information is needed concerning the apparent failures associated with the use of phenothiazine; some factors which have been considered important in these cases are: inadequate doses, improper preparation and use of free-choice mixtures, poor husbandry practices, inadequate herd or flock surveillance, unwarranted reliance on the chemical to control all helminth species, and use of substandard commercial phenothiazine preparations.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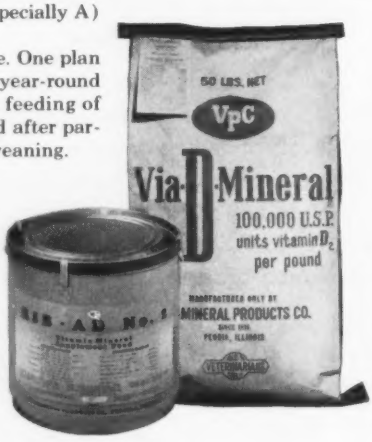

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August, 1961

American Association of Veterinary Bacteriologists. Annual meeting. Department of Microbiology and Public Health, College of Veterinary Medicine, Michigan State University, East Lansing, Mich., Aug. 18-19, 1961. C. H. Cunningham, Department of Microbiology and Public Health, College of Veterinary Medicine, Michigan State University, East Lansing, secretary.

American Veterinary Medical Association. Ninety-eighth annual meeting. Sheraton-Cadillac Hotel, Detroit, Mich., Aug. 20-24, 1961. Dr. H. E. Kingman, Jr., 600 S. Michigan Ave., Chicago 5, Ill., executive secretary.

Electron Microscope Society of America. 19th annual meeting. Pittsburgh Hilton Hotel, Pittsburgh, Pa., Aug. 23-26, 1961. Dr. A. R. Taylor, Research Division, Parke, Davis and Co., Detroit 32, Mich., program chairman.

Washington State Veterinary Medical Association. Annual meeting. Chinook Hotel, Yakima, Wash., Aug. 28-29, 1961. Mr. Robert M. Ford, 2406 Boyer Ave., Seattle 2, Wash., executive secretary.

International Association of Microbiological Societies. Seventh International Congress of the Permanent Section on Biological Standardization. London, England, Aug. 28 to Sept. 1, 1961. E. C. Hulse, Ministry of Agriculture, Central Veterinary Laboratory, Weybridge, Surrey, secretary of organizing committee.

Cornell University and General Electric Advanced Electronics Center. 2nd annual Bionics Symposium. Cornell University, Ithaca, N.Y., Aug. 30 — Sept. 1, 1961. Mr. Robert Earle, General Electric Advanced Electronics Center, Ithaca, N.Y.

September, 1961

Canadian Veterinary Medical Association. 13th annual convention. Banff Springs Hotel, Banff, Alta., Sept. 8-11, 1961. Dr. A. E. Lewis, 403 Public Building, Calgary, Alberta, Canada.

New Mexico Veterinary Medical Association. Alvarado Hotel, Albuquerque, N.M., Sept. 11-12, 1961. Dr. E. Leonard Payne, 1235 Wyoming, N.E., Albuquerque, N.M., secretary.

Robert A. Taft Sanitary Engineering Center. Training Program on Milk Pasteurization Controls and Tests. Cincinnati, Ohio, Sept. 12-14, 1961. Chief, Training Program, Robert A. Taft Sanitary Engineering Center, 4676 Columbia Parkway, Cincinnati 26, Ohio.

Central Indiana Veterinary Medical Association. 7th annual Small Animal Seminar. Indianapolis Athletic Club, Indianapolis, Ind., Sept. 13, 1961. Dr. R. L. Brutus, 7720 N. Michigan Rd., Indianapolis, Ind.

South Dakota Veterinary Medical Association. Annual meeting. Huron, S. Dak., Sept. 14-15, 1961. Dr. Homer K. Caley, Webster, S. Dak., secretary.

Animal Care Panel. 12th annual meeting. Statler Hilton Hotel, Boston, Mass., Sept. 27-29, 1961. Dr. Bernard F. Trum, Sherborn, Mass., general chairman.

Oregon Veterinary Medical Association. Fall clinic meeting. Corvallis, Ore., Sept. 28-30, 1961. Dr. K. J. Peterson, Office of the Secretary, Poultry-Veterinary Building, Corvallis, Ore., program chairman.

Foreign Meetings

7th International Congress of Biological Standardization. Permanent Section of Biological Standardization of the International Association of Microbiological Societies. Wellcome Foundation Ltd., the Wellcome Building, Euston Rd., London N.W. 1, England. E. C. Hulse, Ministry of Agriculture, Central Veterinary Laboratory, Weybridge, Surrey, secretary of organizing committee, Aug. 28-Sept. 1, 1961.

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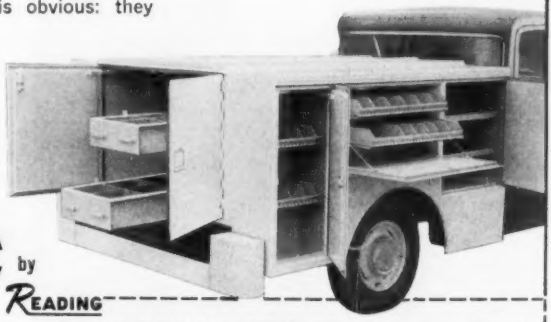

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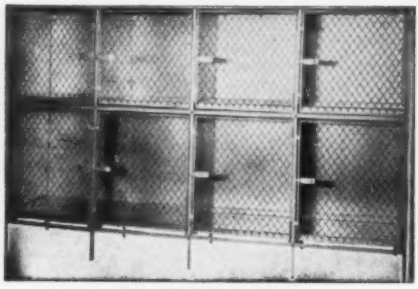

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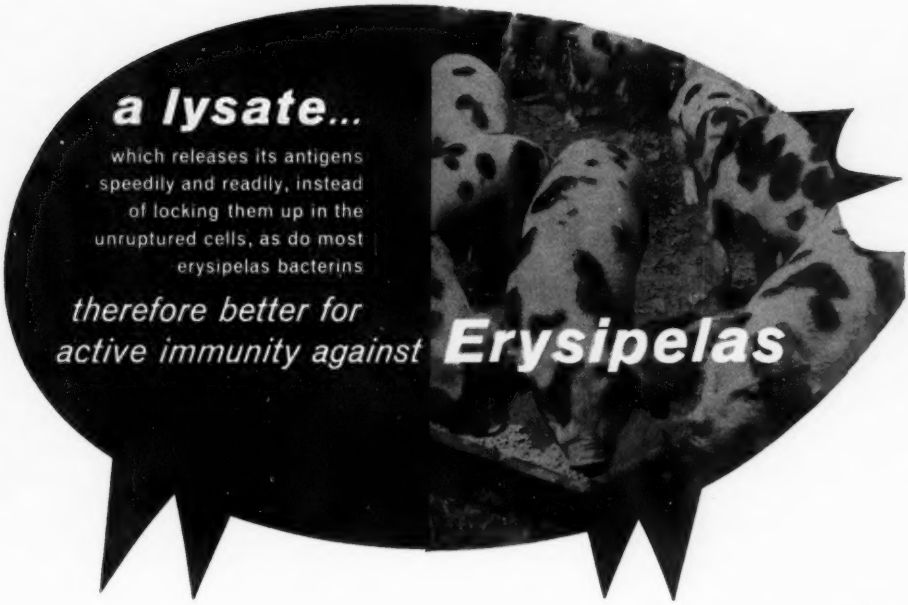
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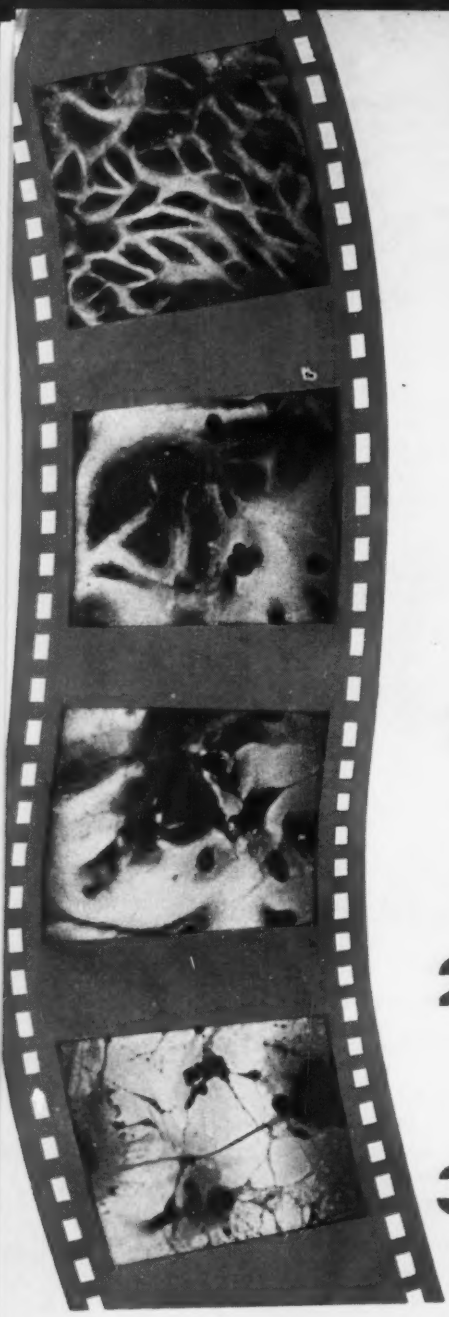

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Clinical and Research References:

1. Sinha, S. K., et al, Studies on Canine Distemper Immunization with a Tissue Culture Vaccine. Vet. Med., Vol. 55, No. 4, April 1960.
2. Burgher, J. A., et al, The Immune Response of Dogs to Distemper. Cornell Vet., Vol. 48, No. 2, 1958.
3. Paton, I. M., et al, Progress in Distemper Immunization. Jen-Sal Small Animal Topics, August 1960.
4. Dept. of Biological Research, Jensen-Salsbery Laboratories. Unpublished Research Data.

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